

**TILAK MAHARASHTRA VIDYAPEETH, PUNE
SHRI BALMUKUND SANSKRIT MAHAVIDYALAYA**

RESEARCH SERIES NO. 7

IDENTIFICATION OF SOMA

By

Dr. C. G. KASHIKAR

Honorary Professor

Shri Balmukund Sanskrit Mahavidyalaya
Tilak Maharashtra Vidyapeeth, Pune

Pune
1990

HPD

*Published with financial assistance from the
University Grants Commission New Delhi.*

Publisher :

Dr. C. L. Kshirsagar
Kulasachiva,
Tilak Maharashtra Vidyapeeth,
Vidyapeeth Bhavan,
Pune - 411 037
INDIA.

First Edition : March 1990

1000 Copies

Price Rs 25

Printed by :

M. G. Joshi
Anand Mudranalaya,
1523 Sadashiv Peth,
Pune - 411 030

CONTENTS

Acknowledgment	iv
Foreword	v
Illustrations	vii
Identification of Soma	1
Word-Index	32
Bibliography	40

ACKNOWLEDGMENT

It gives me great pleasure to present this monograph on 'Identification of Soma' being published by the Tilak Maharashtra Vidyapeeth, Pune. The problem of the identification of Soma had occupied my mind for the last so many years. I was watching the various deliberations concerning the problem which appeared in different forms from time to time. Among such discussions there appeared certain papers which supported the view identifying Soma with Ephedra. Even then I realised that the arguments made in such papers did not touch certain points which I had in my mind. I therefore thought of preparing a monograph expressing my views on the problem without repeating as far as possible what other scholars have said. It is upto scholars working in the field to judge the information, arguments and conclusions arrived at in this monograph.

This monograph was orginally read in the form of a research paper, entitled "Apropos of Soma-Haoma", at the International Congress organised by K.R.Cama Oriental Institute, Bombay during January 5-8, 1989. I should thank the authorities of the Institute for kindly allowing me to publish the paper through a different source. I am also thankful to the Tilak Maharashtra Vidyapeeth for undertaking the publication of this monograph. Thanks are also due to Dr. S.S.Bahulkar, Principal, Balmukund Sanskrit Mahavidyalaya and Mrs. Sucheta Paranjpe for seeing the publication through the press.

Pune, March 1990

C. G. Kashikar

FOREWORD

The problem of identifying what exactly was the Soma plant so prominently referred to in Vedic literature, has occupied the attention of many erudite research scholars of Indology and of botanists, for over a century.

The learned author of this monograph has observed: "The problem of identification became more acute when R. Gordon Wasson put forward altogether a new thesis that the Soma was a mushroom, Fly agaric, *Amanita muscaria*. Much has been written on the problem of identification before and after the publication of Wasson's book. This paper is not intended to recapitulate the entire discussion. I propose to make here a short reference to the data from the *Rgveda*, present a study of the post-*Rgvedic* literature so as to shed light on the identification of Soma-Haoma, critically examine the evidence put forth by Wasson, and finally express my view about the identification".

His findings are : "A century has elapsed since the problem of the original Soma-Haoma came up for discussion. Our knowledge of the Vedic religion and of the botany of the plants in question has much advanced in recent times. Consequently the problem has not remained difficult of solution. As discussed in these pages, the genus *Ephedra* with all the species is the only plant which rightly claims to be identified with the Soma-Haoma. Several scholars and botanists have arrived at this conclusion".

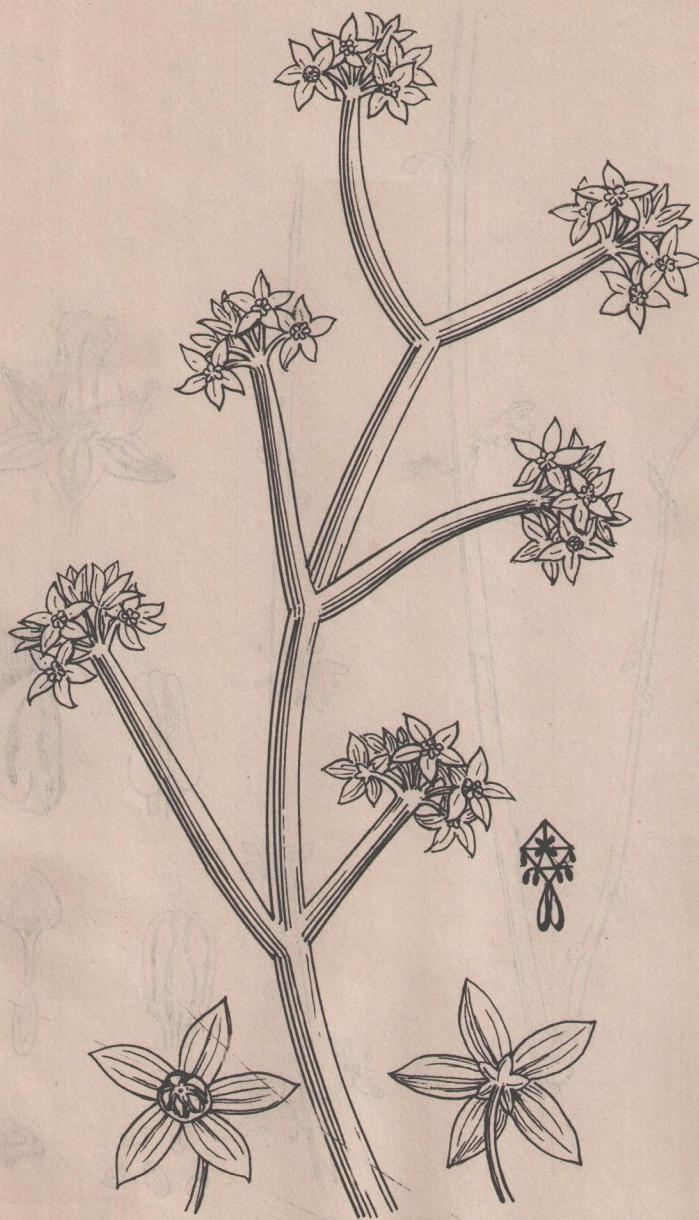
Tilak Maharashtra Vidyapeeth is very happy to publish the analysis of the problem of Soma made by Dr. C. G. Kashikar, who is one of the foremost scholars of Vedic literature, in the country. Recipient of many awards and honours in recognition of his very valuable contribution, his versatile approach to problems of Vedic, linguistic and other research is marked by a depth of thorough study of all available work on each subject, e.g. on the botanical aspects of plants in India. In this context, he had

delivered, in 1970, lectures under the auspices of Nagpur University on 'the History of plants in India'. The Vidyapeeth is confident that Dr. Kashikar's a present Work will be read with great profit and interest by all those who are interested in the subject.

March 15, 1990

Pune.

Dr. S. V. Sohoni
Vice-chancellor
Tilak Maharashtra Vidyapeeth.



Sarcostemma brevistigma



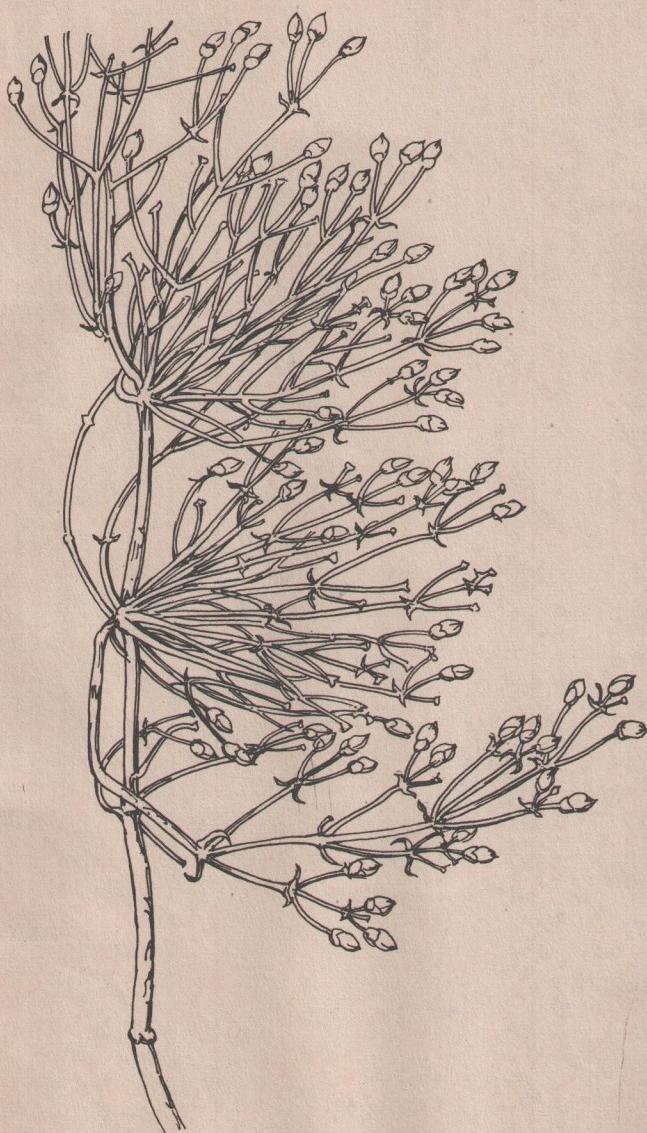
Periploca aphylla



| Rhubarb



Amanita muscaria



Ephedra

INTRODUCTORY

In the Indo-Aryan and Iranian cultures, there are several aspects which compare favourably with each other. Among the rituals elaborately laid down in the Vedic literature of Indo-Aryans, the Soma-sacrifice stands prominent. Among the religious rites of the Iranians, the Yasna ceremony plays a specific role. Soma is the principal oblation in a Soma-sacrifice and Haoma in the Yasna ceremony. A detailed survey of the Soma-sacrifice, the Soma-libation and the god Soma was made by A. Hillebrandt¹, Oldenberg², and others. The Yasna ceremony of the Iranians has been described by J. J. Modi³, Martin Haug⁴, Spiegel and others. All these scholars clearly stated that Soma-Haoma was a plant. Many Vedic scholars and botanists attempted in their own way to identify the plant. Hillebrandt who based his review on a deep study of the Rgvedic hymns and also the post-Rgvedic literature including the Yajurveda Samhitās, Brāhmaṇas and Śrautasūtras, did not, however, express his positive opinion on the identity of the Soma-plant. This was understandable because in his time when Hillebrandt prepared the second, revised edition of his *Vedische Mythologie* in two parts, the botanical study of the different plants claiming identity with Soma-Haoma was in a preliminary stage.

The problem of identification became more acute when R. Gordon Wasson⁵ put forward altogether a new thesis that the Soma was a mushroom, Fly agaric, *Amanita muscaria*. Much has been written on the problem of identification before and after the publication of Wasson's book. This paper is not intended to recapitulate the entire discussion. I propose to make here a short reference to the data from the Rgveda, present a study of the post-Rgvedic literature so as to shed light on the identification of Soma-Haoma, critically examine the evidence put forth by Wasson, and finally express my view about the identification.

J. Brough⁶ has critically examined the Rgvedic verses which have been claimed by Wasson as supporting his mushroom theory. He has refuted Wasson's interpretations of Rgvedic verses, and has firmly expressed his view that Soma could never be a mushroom, but was a plant. I fully agree to Brough's conclusion. Finally Brough says, "to be fair, it must be added that not all the species of Ephedra contain the alkaloid, and of those which do, its concentration may vary considerably in relation to climatic conditions and geographical distribution. It would seem that much work remains to be done in botany, chemistry and pharmacology before it will be sensible to make a further attack on the problem of the identity of the Soma-plant."⁷ F. B. J. Kuiper⁸ in his review of Wasson's book has also expressed his disagreement with the interpretation of Rgvedic verses given by Wasson. The latter tried to meet the objection raised by these and other scholars.⁹

1. A HILLEBRANDT, *Vedische Mythologie* Part I, Chapter IV together with Appendix I, English Translation, Delhi, 1980, Pp. 121-476.
2. OLDENBERG, *Die Religion des Veda*, Berlin, 3rd edn., 1923.
3. J. J. MODI, *The Religious Ceremonies and Customs of the Parsees*, Bombay, 1922.
4. Martin HAUG, *Essays on Sacred Language, Writings and Religion of Parsees*, Bombay, 1862.
5. R. Gordon WASSON, *Soma : Divine Mushroom of Immortality*, New York, 1969.
6. J. BROUH, "Soma and Amanita muscaria," *BSOAS XXXIV*, Part 2, London, 1971, Pp. 331-362.
7. J. BROUH, *op. cit.*, p. 362.
8. F. B. J. KUIPER, *I-IJ XII*, 1970, Pp. 279-285.
9. R. Gordon WASSON, "The Soma of the Rgveda : What was it ?," *JAOS XCI* (2), 1971, Pp. 169-187; *Soma and fly-agaric*, Ethnomycological Studies, Cambridge, 1972; "Soma brought up-to-date," *JAOS XCIX* (1) 1979, Pp. 100-105.

RGVEDA

We gather from the Rgveda that Soma is a plant (*oṣadhi*). It has shoots which are pressed (1.91.17; 125.3; 168.3; 3.48.2; 9.62.4; 95.4) The shoots are tawny (9.92.1 etc.). Soma grows on mountains (5.36.2; 43.4; 85.2; 9.18.1; 46.1; 71.4; 85.10). It grows on the Mūjavat mountain (10.34.1); around the Śaryanāvat lake and on the Rjika mountain (8.64.11). It is brought by eagle (1.93.6; 10.144.5). Its juice is tawny (*aruṇa, babhru, harit* 7.98.1; 9.26.5; 57.2; 63.4). The juice is mixed with water and also with milk, curds or gruel (2.13.1; 36.6; 5.27.5; 36.1; 6.20.6; 8.72.2; 9.72.6; 107.2; 10.17.12,13).

The Rgvedic hymns provide certain details in respect of the pressing of shoots and the extracted juice, pounding of the shoots on a crushing stone placed on two wooden planks covered with bull's hide, mixing the extracted juice with water, passing it through a woollen filter into a wooden trough, collecting the liquid into earthen jars, pouring milk into the Soma-juice, pouring hot milk or curds or barley-flour into the cups filled with Soma-juice , and offering the libation on the Āhavanīya fire,etc.

The description of Soma found in the Rgvedic verses is not adequate to correctly identify the Soma-plant botanically. A. A. Macdonell and A. B. Keith¹⁰ and A. Hillebrandt¹¹ have already stated this. Even then Wasson asserted that the Soma-problem must be solved with the help of the Rgvedic hymns alone. He said, "I wished to read the Rgveda stripped of exegesis, stripped of the confusing influence of post-Vedic mythological and ritualistic thinking, to see how far I could make out the meaning from the simple words of the songs."¹² As already observed, examining merely the Rgvedic verses for the botanical identification of Soma is not adequate, and furthermore, the way in which the attempt has been made is not convincing. Hillebrandt was, therefore, right when he collected information also from the Yajurveda Saṁhitās,

10. MACDONELL and KEITH, *Vedic Index of Names and Subjects* II, London, 1912, p. 475.

11. A. HILLEBRANDT op. cit., I, p. 159.

12. R. Gordon WASSON, "Soma : Comments inspired by Professor Kuiper's Review" *I-IJ XII*, Pp. 286-298.

Brāhmaṇas and Śrautasūtras for the purpose of building up the picture of Soma-cult—the picture which would shed further light on the problem of identification.

One can hardly expect any information from the Atharvaveda in view of its specific character. The only useful reference is to the Müjavat mountain to which the disease-demon *Takman* is asked to go.¹³ The other regions mentioned for the same purpose are Mahāvṛṣa and Bahlika which indicate the direction towards which the Müjavat lies.

13. AV. 5.22.5,7,10.

YAJURVEDA AND BRĀHMANAS

The Yajurveda in all its available Saṁhitā-texts, the Brāhmaṇas and Śrautasūtras supply additional information useful for our purpose in view of their ritualistic character. There are different types of Soma-sacrifices – Ekāhas, Ahīnas and Sattras. There are again numerous optional sacrifices in each of these categories. We need not go to the numerous sacrifices in those categories because, barring the additional Soma-cups to be offered and the additional days involved in the Soma-offerings, the main structure in regard to the procuring of Soma, the pressing, collecting the juice and offering the libations would be similar. These items which are described in the basic Agniṣṭoma sacrifice are presumed in all other Soma-sacrifices. Hillebrandt has therefore extracted information regarding the Soma-cult from the Agniṣṭoma as described in the Brāhmaṇas and Śrautasūtras. I propose to pick up only such additional information from these resources as would render help in identifying the plant.

There is no doubt that chronologically there is a difference between the Rgveda, and the Yajurveda and the Brāhmaṇas. The latter reflect a picture of the Vedic ritual which was decidedly later than that which we can sketch with the help of the Rgvedic hymns. Hillebrandt has rightly said that "From the very beginning the Agniṣṭoma was not the complete sacrifice as it is now",¹⁴ that is, in the Yajurveda, Thus even though there was a change from the Rgveda, there was definitely a continuity of the ritual that prevailed in the period when Rgveda hymns were composed. Wasson excludes post-Rgvedic literature from his purview on the ground that the original plant had already been replaced by substitutes. We shall later on see that Wasson's view about the substitutes is untenable. Hillebrandt has pointed out numerous features of the Soma-ritual as found in the Rgveda which have a continuity in the post-Rgvedic literature. In consideration of this continuity we can judge the value of the additional information

14. A. HILLEBRANDT, *op. cit.*, p. 427.

from the post-R̄gvedic literature for verifying the ritual in the R̄gvedic period. The character of R̄gveda is such that one cannot expect the poets of the hymns to give all ritualistic details.

Wasson holds a different view. He says, "The only way to read my book is with the text of the R̄gveda in hand. My identification of Soma must be judged by the words of the hymns; the hymns of the canon upto, but excluding, the last batch to be admitted. The corpus of the post-Vedic exegesis is irrelevant, compiled as it was by persons ignorant of the botany of the plant. If my findings are compatible with the words of the R̄gveda, then Hillebrandt, Roth, Kuhn etc. must be cut to fit my interpretations. Hillebrandt and Co. were failures so far as the Soma enigma goes."¹⁵ I am afraid no serious student of the Veda will share Wasson's view when he totally rejects the post-R̄gvedic literature as cut off from the R̄gveda. There is a regular continuity, of course characterised by change, from R̄gvedic to the post-R̄gvedic literature so far as the ritual is concerned.

The identification of Soma is not a purely botanical problem. In fact, it is a religio-historical problem to be solved by the Vedists with the necessary aid of botany. Wasson holds the opposite view. He says, "When you seek the identity of a plant, you go to a botanist, not to a Vedist. In the quest for the identity of Soma the Vedist should stand at the botanist's elbow and help with a literal translation of the words and with alternative readings when the Vedist thinks they are there".¹⁶ I think there is hardly any Vedic scholar who will submit to Wasson's view, and allow a Vedist to be at the mercy of a botanist like Wasson who has exploited Renou's interpretations of R̄gvedic verses to his purpose. Wasson claims, "Perhaps I am the first person with any botanical training to read the recent scholarly translation of the R̄gveda concentrating on the Soma question".¹⁷ I know at least two more scholars (i) the late Dr. N. A. Qazilbash, Professor of Botany, Peshawar University, Peshawar (Pakistan) and (ii) Dr. S. Mahdi Hassan, a scholar of Asian culture, Karachi (Pakistan)

15. WASSON,*op. cit.*, p. 291.

16. *ibid.* p. 294.

17. *ibid.* p. 295.

whose researches have recently been collected in his book, *The History and Natural History of Ephedra as Soma*, Islamabad, 1983.

It may be noted at the outset that the characteristics of the Soma-plant which are known from the R̄gvedic verses are clearly expressed in the Yajurveda Samhitās and the Brāhmaṇas. In this literature three topics which provide additional information helpful for the identification are worthy of attention:

(i) Procuring and ceremonial purchasing of Soma,
(ii) Extraction of juice and pouring into it other liquids for preparing the libation, and
(iii) expiations in contingencies on Soma being snatched away. Because the Yajurveda Samhitās were composed at more or less the same time when the ritual-tradition had become stabilised in the plains of Punjab and adjoining regions, one meets in them with almost a similar picture of ritual covering the above-mentioned three topics.

Procuring and Ceremonial Purchasing of Soma The superior quality of Soma-plant lay in the distant mountains; therefore, arrangements had to be made sufficiently in advance to procure the plant in adequate quantity. The Soma was ceremonially purchased from the seller on the day next to that on which the sacrificer was consecrated for the sacrifice (*dīkṣā*). At the ceremonial purchase the Adhvaryu enquired with the Soma-seller whether the Soma was brought from the Müjavat mountain, and the latter replied that indeed it was from the Müjavat. Thus the Soma from the Müjavat was known to be of the best quality. One comes across this questioning in many Śrautasūtras from the oldest Baudhāyana Śrautasūtra downwards. It is possible that in the case of the late Śrautasūtras the questioning might have remained a mere formality observed traditionally. Before the formal purchase, the Soma-plant was sifted and other materials and bruised shoots were removed. This was done by persons not connected with the sacrificer. It was very likely that the aboriginal person who procured the Soma picked up into his bundle even some other plants which looked similar and grew side by side with the genuine Soma. Only genuine and healthy shoots were selected for purchasing. The shoots were tied into bundles which were then counted and fastened into a linen

garment. The load was placed into a bullock cart which was carried towards the Prācīnavarṇa-hall. Optionally the Soma was brought as a head-load. The bundle of Soma was deposited upon a wooden stool at least for three nights. During this period the shoots of Soma were ceremonially swollen with water every morning and afternoon, so that they may remain fresh.

In the period of the Śrautasūtras it was customary to procure and preserve the Soma in a religious manner. The Baudhāyana Śrautasūtra mentions the fastening up of the bundle of Soma-plant to the middle beam when the sacrificer enters the Prācīnavarṇa-hall and is consecrated for the Soma-sacrifice. In this connection the Baudhāyana Dvaidhasūtra¹⁸ records the different views of teachers. Bodhāyana says that the sacrificer should not undergo consecration unless he virtually perceives for himself the Soma-plant having been in his possession and the officiating priests who are to be chosen for the sacrifice. Sāliki, on the other hand, holds the view that one may undergo the consecration in case the Dīkṣā-days are many, the procurers of Soma have promised to supply the Soma in time, and one is sure about the arrival of the Sāman-priests. Concerning the entry into the Prācīnavarṇa-hall by the sacrificer at midday, Bodhāyana instructs that water-pitchers should be carried ahead, and then the sacrificer should follow taking up the Soma and kindling woods. Āpastamba¹⁹ lays down the practice of bringing in the bundle of Soma in the Prācīnavarṇa-hall from the sacrificer's residence prior to the performance of the Dīkṣāṇīyeṣṭi and, because the Soma is a divinity, of offering him milk and cooked rice until the time of the ceremonial purchase. Vikhanas²⁰ also prescribes similarly; as food to be offered to Soma, he mentions rice cooked in milk, (*pāyasam annam*) and parched paddy (*lājā*).

18. BaudhSS. 6.1: *athā' māvāsyena vā haviṣeṣṭvā nakṣatre vā'raṇyor agnīn samārohya ṣālām abhi praiti* [21.7 : *sa ha smā"ha bodhāyano nā'dṛṣṭvā rājānam ca'rtvijas' ca dīkṣayed iti*" atro ha smā"ha ṣālīkir "yadi dīkṣā dīrghāḥ syur āśvasikā āhartāras tatho'dgīthah kāmarām dīkṣayed iti" "śālāyā adhyavasāna iti" sa ha smā"ha bodhāyano "madhyāindine ṣālām adhyavasyet / āpaḥ pūrvā gaccheyur anvag yajamāno rājñā cā'raṇibhyām ce'ti"] *uttareṇā ṣālām parītya pūrvayā dvārā ṣālām prapādyā gārhapatyasyā*"yatane mathitvā'gnin vihṛtya madhyame varṇe rājānam pragrathnanti, paristhānti /

19. ApSS. 10.3.7: *atra rājānam āhṛtya payasau'danena pariveviṣanty ā krayāt /*

20. Vaikhss. 12.4: *somāya rājñe śālāyām pāyasam annam lājāñś cā'krayād upāharanti /*

Soma Being Snatched Away Let us now take up the third topic because it is also concerned with the Soma-plant itself. There was the possibility of the Soma-plant procured for a sacrifice being snatched away. In this connection Hillebrandt says, "... In a land where the plant grew in abundance, there must have been miscreants who grudged others pleasure or who secretly took away the herb which had been freshly brought from the mountain or collected in the valleys from the pious men who were getting ready to offer it in sacrifice whether to sell it again or to enjoy it themselves. For it is not likely that Soma grew on the roadside within easy reach of everybody. One had at least to fetch it from the mountains or collect it in the valleys either oneself or make others to collect it, and even from this fact it follows that the plant had a certain commercial value in the ancient period".²¹

This contingency as recorded in the Brāhmaṇas and Śrautasūtras needs to be carefully looked into. If the Soma procured from a long distance for a sacrifice were snatched away while it was not yet ceremonially purchased, it is prescribed that one should procure Soma anew, purchase it ceremonially at the proper time and go through the formal performance. If it were snatched away after it was ceremonially purchased, one should procure other Soma which may become available at the nearest

21. HILLEBRANDT, *op. cit.*, I, p. 134.

22. KāṭhS XXXIV.3: *yady akritam apahareyur anyaḥ krītavyaḥ / yadi krītam yo nedishthām syāt sa āhṛtyā'bhiṣutyaḥ rājāhārāya tu kiṁcid dīyate /*

b 20

23. ŠBr. IV.5.10.1: *yadi somam apahareyur vidhāvate'cchate'ti brūyat / sa yadi vindati kim ādriyeran /*

24. TāṇḍBr. IX.5.1: *yadi somam akritam apahareyur anyaḥ kretavyah / yadi krītam yo'nyo'bhyāśām syāt sa āhṛtyaḥ / somavikrayiṇe tu kiṁcid dadyat /*

25. JaiBr. I.354: *yady akritam rājānam apahareyur ā vettor iccheyuh ... yadi krītam apahareyur yam eva kam cā'dhigatyā'bhiṣuṇuyuh / yenai'vā'sya pūrvakrayena krīto bhavati tenaivā'syāmām krīto bhavati / somavikrayiṇe tu kiṁcitkaṁ deyam /*

26. MānŚS. 3.6.3: *yadi rājānam apahared yo nedishthī somaḥ syāt tam abhiṣuṇuyāt / somavikrayiṇe kiṁcid dadyat /*

27. ĀpŚS. 14.24.9-10: *yasyā'krītam somam apahareyuh krīṇiyād eva // 9 // yadi krītam yo nedishthī syāt tata āhṛtyā'bhiṣuṇuyāt // 10 //*

place and press it. Something should be given away to one who had fetched the new Soma. The formal sacrifice should then be concluded. This provision of procuring Soma anew has been made in the Kāṭhaka Saṁhitā²², Śatapatha Brāhmaṇa²³, Tāṇḍya Mahābrāhmaṇa²⁴, and the Jaiminiya Brāhmaṇa.²⁵ Among the Śrautasūtras the Mānava²⁶, Āpastamba²⁷ and Satyāśādha²⁸ prescribe similarly. The Prāyaścitta-portion is absent in the Maitrāyaṇī Saṁhitā; hence there is no reference to this contingency in that text. The Kāṭhaka and Maitrāyaṇī recensions flourished in the vicinity of each other. From the fact that, the Kāṭhaka Saṁhitā and also the Mānava Śrautasūtra belonging to the Maitrāyaṇī Saṁhitā refer to this contingency, it may be surmised that the present Maitrāyaṇī Saṁhitā might have suffered from insecure tradition. The Taittirīya tradition²⁹ to which Āpastamba and Satyāśādha Śrautasūtras belong, has not asked the sacrificer to procure new Soma from the nearest place. The two Śrautasūtras borrowed this provision from the Kāṭhaka or the Mānava Śrautasūtra. It is well-known that Āpastamba and Satyāśādha adopt certain ritual prescriptions from the Kāṭhaka, Maitrāyaṇī and also the Vājasaneyaka traditions, sometimes even ignoring the prescriptions of their own recension.

Coming to the R̥gvedic tradition we find that in the event of Soma being lost or burnt out after it has ceremonially been purchased, the sacrificer is asked to procure and press another Soma (that is to say, Soma procured from the nearest place).³⁰ R̥gveda Brāhmaṇas have not mentioned this contingency.

It is to be noted here that there was no harm to the formal performance of the Soma-sacrifice even though the ceremonially purchased Soma was snatched away; because the snatched Soma could be replaced by genuine Soma. The Jaiminiya Brāhmaṇa clearly says that the newly procured Soma must be regarded to

28. SatySS. 15.6.12-14: *yady akrītaṁ somam apahareyur anyaḥ kreyaḥ // 12 // yadi kṛītam yo nedīṣṭhī syāt tata ḫṛtyā'bhiṣuṇyāt // 13 // somāhārāya somavikrayiṇe vā kiñcid dadyāt // 14 //*

29. TaiBr. 1.4.7 simply speaks about the Soma which is snatched away before ceremonial purchase: *yasyā'kṛītam somam apahareyuh Krīnīyād eva / sai'va tataḥ prāyaścittih* / BaudhSS.14.29 follows this.

30. ĀsvSS. 6.8.1,4: *krite rājani naṣṭe dagdhe vā // 1 // anyaḥ rājānam abhiṣuṇuyuh // 4 //*

have been purchased by giving away as if the very same things which were already given away while purchasing Soma for the first time. When the Mānava, Āpastamba, Satyāśādha and Āśvalāyana Srautasūtras prescribe the procuring of Soma which was available at the nearest place, it must be assumed that they knew the original Soma which was procured from the mountain and also the one which was available at the nearest place.

Even if genuine Soma did not become available at the nearest place to replace the Soma which was snatched away, the performance already commenced had somehow to be concluded. The scriptures have found the way out. Thus the Kāthaka Samhitā³¹ prescribes: One should press the *pūtīka* plant. If he does not obtain *pūtīka*, he should press the *arjuna* plant. In the morning pressing one should offer fresh milk and *pūtīka*, in the midday pressing curds and *pūtīka*, in the afternoon boiled milk and *pūtīka*. The Taittiriya Brāhmaṇa³² says, if ceremonially purchased Soma is snatched away, one should press the *ādāra* and *phālguna* plants. Their juice should be mixed with boiled milk in the morning pressing, with curds in the midday pressing, and with curds mixed with butter in the third pressing. The chanting in the Agniṣṭoma sacrifice should be characterised by the Rathantaraṛṣṭha. The priests who have already been formally chosen should officiate in this sacrifice. Only one cow should be

31. KāthS. XXXIV.3: *yadi somam na vindeyuḥ pūtikān abhiṣuṇuyuḥ / yadi na pūtikān ārjunāni / gāyat्रī vai somam apāharac cheyō bhūtvā / tasya somarakṣir anuvisṛjya nakham acchinat / tato yo'mśur amucyata sa pūtiko'bhavat / ūtikā vai nāmai'te / yad ūtikān abhiṣuṇvanyūtīm eva yajñāya kurvanti / indro vai vṛtram ahans tasya yal lohitam āsīt tāny ārjunāni lohitatūlāny abhavan / atha yo grīvāhyah pravṛdhāhyo rasah samasravat tāny ārjunāni babhrutūlāny abhavan / somo vā eṣo'surya iva tu tasmān nā'bhiṣuṭyāḥ / pratidhuk ca prātaḥ pūtikāś ca dadhi mādhyāndine pūtikāś ca / śrtāṁ cā'parāhne pūtikāś ca /*

32. TaiBr. 1.4.7: *yasya kṛitam apahareyuh|ādārāñ ca phālgunāni cā'bhiṣuṇuyāt ... ya eva ṛtvijo vṛtāḥ syus ta enām yājayeyuḥ / ekām gām dakṣinām dadyāt tebhya eva / punaḥ somām kriṇyāt /*

b 21

33. ŚBr. IV.5.10.1-6: *yady u na vindanti tatra prāyaścittih kriyate / dvayāni vai phālgunāni lohitapuṣpāni cā'ruṇapuṣpāni ca / sa yāny aruṇapuṣpāni phālgunāni tāny abhiṣuṇuyāt ... yady aruṇapuṣpāni na vindeyuḥ śyenahṛtam abhiṣuṇuyāt ... yadi śyenahṛtam na vindeyur ādārān abhiṣuṇuyāt ... yady ādārān na vindeyur aruṇadūrvā abhiṣuṇuyāt ... yady aruṇadūrvā na vindeyur api yān eva kāmī ca kuśān abhiṣuṇuyāt / tatrā'py ekām eva gām dadyāt / athā'vabhr̥thād evo'detya punar dīkṣeta / punar yajño hy eva tatra prāyaścittih /*

given away as Dakṣinā. The sacrificer should again purchase Soma at the suitable time and perform the sacrifice. The Śatapatha Brāhmaṇa³³ prescribes: If one is unable to obtain Soma, the expiation is to be made. The *phālguna* plant is of two kinds—having red flowers and tawny flowers. One should press the *phālguna* plant having tawny flowers. If *phālguna* plant with tawny flowers is not available, one should press the *śyenahṛta* plant.³⁴ If that is not available *ādāra* plant should be pressed. If *ādāra* plant is not available, one should press tawny *dūrvā* grass. If that is not available, one should press any variety of green *kuṣa*. In this sacrifice the sacrificer should give away only one cow to the priests as Dakṣinā. After having returned from the Avabhr̥tha, the sacrificer should again get consecrated for a Soma-sacrifice. A repeated formal performance of the sacrifice is the expiation in that behalf.

Because the contingencies in regard to the Soma are related to the sacrificer, even the Vedic recensions other than the Yajurveda have taken their cognisance. The Tāṇḍya and Jaiminīya Brāhmaṇas of the Sāmaveda have laid down the expiations to be observed in the event of the non-availability of Soma. The Tāṇḍya Brāhmaṇa³⁵ says: If the Soma does not become available, one should press the *pūtīka* plant. In the absence of the *pūtīka*, the *arjuna*. In the morning pressing fresh milk and *pūtīka*-juice mixed together should be offered. Boiled milk and *pūtīka* in the midday pressing, curds and *pūtīka* in the

34. What this *syenahṛta* plant was is not clear. Literally it means “carried away by an eagle”. Eagles used to consume the red fruits of *Ephedra* the seeds of which were fertilised and were dropped from the mountain in valleys and around lakes through excreta and grew in abundance. The Soma thus growing near the habitations was not valued as equal to the Soma on the mountains because it did not possess the high qualities of the Soma on the mountains. Since the Brāhmaṇa mentions *syenahṛta* after substitutes like *phālguna*, it must be taken to be different from the genuine Soma, i.e., *Ephedra*. Following ŚBr. and KātyāSS. Falk (See Note 52 below) understands by *Syenahṛta* a pending part of a tree reminding one of the epiphytic Aśvattha.

35. Tāṇ Br. 9.5.3-13: *yadi somarī na vindeyuḥ pūtikāḥ abhiṣuṣuyuḥ / yadi na pūtikāḥ arjunāni pratidhuk ca prātah pūtikāś ca / śrātarī ca madhyārādine pūtikāś ca / dadhi cāparāhne pūtikāś ca ... yāni babhrutūlāny arjunāni tāny abhiṣuṣuyāt ... śrāvantiyam brahmaśāma kāryam ... yajñāyajñiyam anuṣubhi prohet ... vāravantiyam agniṣṭomasāma kāryam ... pañca dakṣinā deyāḥ ... avabhr̥thād udetya punar dīkṣeta / tatra tad dadyād yad dāsyan syāt /*

afternoon. If *arjuna* plant is to be used, the one with tawny panicles should be chosen. The Śrāyantīya Śāman should be chanted as the Śāman related to the Śastra of the Brāhmaṇācchāraṁsin. In the Ārbhavapavamāna Stotra the Āndhīgava Śāman should be substituted by the Yajñāyajñīya Śāman based on the Anuṣṭubh verses. The Vāravantīya Śāman should be chanted as the Agniṣṭomastotra. Five cows should be given away as Dakṣinā. After having returned from the Avabhr̥tha, the sacrificer should again undergo consecration for the formal sacrifice. In this sacrifice, he should give away those Dakṣinās which he had proposed to give in the regular sacrifice.

The Jaiminiya Brāhmaṇa³⁶ prescribes as follows: If Soma could not be obtained, one should press the *phālguna* plant with tawny panicles. If one does not obtain *phālguna* he should press *pūtīka*. If not *pūtīka*, white *sād*. If not white *sād*, *parṇa*. If not *parṇa*, any other plant. In respect of the libations and Dakṣinās Jaiminiya agrees with the Tāṇḍya.

Coming to the Śrautasūtras we find that the Mānava Śrautasūtra does not entertain the contingency of non-availability of Soma. The Sūtrakāra was sure that Soma did become available nearby in case the necessity to procure it arose. The Śrautasūtras of Bodhāyana (14.29), Āpastamba (14.24. 12-20) and Satyāśāḍha (15.6. 15-20) generally follow the injunction in the Taittirīya Brāhmaṇa. It may be noted here that Bharadvāja, Āpastamba and Satyāśāḍha asked the sacrificer desirous of Brahman-splendour to offer the Soma-juice in his daily Agnihotra-offering.³⁷ The Vaikhānasa Śrautasūtra does not refer to the contingency of Soma being snatched away, nor does it say anything about the substitutes. This Śrautasūtra was composed at a later date in South India, hence its author could not be expected

36. JaiBr. 1.354-355: *yadi tam na vindeyur babhrutulāni phālgunāny abhiṣuṇuyuh ... yadi tam na vindeyur ütikān abhiṣuṇuyuh / yadi tam na vindeyuḥ śuklāḥ śādo'bhiṣuṇuyuh ... yadi tam na vindeyuḥ parṇam abhiṣuṇuyuh ... yadi tam na vindeyur yā eva kāś cauṣadhir abhiṣuṇuyuh ... pratidhuk prātaḥsavane'vanayec chṛtaṁ mādhyaśāṇine savane dadhi tṛtīyasavane ... pañca dakṣinā dadyāt ... avabhr̥thād udetya punar dīkṣeta / sa yāvad dāsyān syāt tad dadyāt / sai'va tatra prāyaścittih /*

37. BhārSS. 6.16.14; ĀpSS. 6.15.1; SatySS. 3.19.22: *Somena brahmava-rcasakāmasya /*

to have the knowledge of the original Soma. With him the substitute might have been the rule. The Kātyāyana Śrautasūtra (25.12. 18-21) follows the Śatapatha Brāhmaṇa. The Āśvalāyana Śrautasūtra³⁸ asks the sacrificer to procure *pūtīka* and *phālguna*. If *phālguna* is not available, he may take up any other plant together with the *pūtīka*. In case the Soma is lost during Dīkṣā-days, the sacrificer is advised to prolong Dīkṣā-days until Soma becomes available. In case Soma is lost during Sutyā-days, the sacrificer will be obliged to employ the substitute.

From the above mentioned prescriptions certain things become clear. In case the Soma ceremonially purchased for a sacrifice was snatched away, one should procure Soma from the nearest place and conclude the sacrifice. If it could not become available, one should procure the substitute and conclude the sacrifice in a modified form. After this performance is over, one should again purchase genuine Soma and perform the regular sacrifice. Thus, in the view of the Brāhmaṇas and also the Śrautasūtras, only a Soma-sacrifice performed by offering genuine Soma was considered as a *true* sacrifice. A sacrifice performed by offering a substitute was not a formal sacrifice.

Soma-libations Now let us proceed to the second topic, namely, extraction of the juice and pouring into it other liquid for preparing the libation. At the morning pressing, Soma-shoots were pounded and mixed with water on a lower crushing stone placed on a bull's hide which was spread out so as to make a hollow on two wooden planks. The water used for this purpose was twofold:

(i) Vasatīvarī water brought in earthen pitchers from the adjacent river on the previous afternoon, and (ii) *Ekadhana* pitchers filled in from that river in the morning of the pressing day. The juice was extracted out of nearly half the quantity with the addition of adequate quantity of water and was collected in a

38. ĀśvSS. 6.8.5-16: *anadhi game pūtīkān phālgunāni // 5 // anyā vā oṣadhyayaḥ pūtīkaiḥ saha // 6 // prāyaścittān vā hutvo'ttaram ārabheta // 7 // sutyāsū'ktam eva manyeta // 8 // pratidhuk prātaḥsavane // 9 // śṛtam mādhyamidine // 10 // dadhi tṛtiyavasene // 11 // śrāyantāyam brahmaśāma yadi phālgunāni vāravantiyam yajñāyajñīasya sthāne // 12 // śrāyantiyam eke // 13 // ekadakṣiṇām yajñām sansthāpyo'davaśāya punar yajeta // 14 // tasmin pūrvasya daksiṇā dadyāt // 15 // somādhigame prakṛtyā // 16 //*

jar known as *Ādhavaniya*. The residue of Soma-shoots was put into the Soma-juice in the *Ādhavaniya* jar, it was then taken out and was thoroughly twisted. The residue was then preserved safely. A woollen filter was placed on the *Pūtabhṛt* jar, and the liquid from the *Ādhavaniya* jar was passed through the woollen filter and collected into the *Pūtabhṛt* jar. Milk was then poured into that jar so as to form a mixture of Soma-juice and milk. This addition caused fermentation of the milk. The cups, vessels and goblets were filled in with this mixture. Hot milk was further added to the cup for Mitra-Varuṇa, and flour of parched barley was put into the *Manthi* cup. The contents of these cups became further fermented. The fermented libations were partly offered on the *Āhavaniya* fire and partly consumed by the officiating priests and the sacrificer within a few hours.

The remaining Soma-shoots were similarly pressed at the midday pressing, and milk was added to the Soma-juice in the *Pūtabhṛt* jar. To the *Manthi* cup was added the flour of parched barley as before. The residue of the Soma-shoots was preserved as before.

Only the residue of the Soma-shoots was pressed at the third pressing which generally commenced in the afternoon. The liquid obtained by mixing the juice of residue with adequate quantity of water must, of course, be much diluted. It was further mixed with milk, and the mixture was collected in the *Pūtabhṛt* jar as before. The *Āditya* cup was filled in with Soma (that is, Soma-juice mixed with milk) and curds obtained by curdling boiled milk. Boiled milk was added to the cup for Mitra-Varuṇa.

In the Agniṣṭoma sacrifice, there are only six cups to be offered in the third pressing, and the entire Soma-offering is expected to be finished long before sunset. The question arises: what was the propriety in pressing the residue of Soma which obviously contained very little juice-element? There were five cups characterised by Sāman-chanting and Śastra-reciting in the morning pressing, five in the midday pressing and only two in the third pressing. Would it not have been reasonable to press Soma-shoots, not residue, even in the third pressing? What led the institutors of the Soma-sacrifice to introduce the extraction of residue even for a very limited number of Soma-cups? It would seem that since the residue of Soma-shoots producing very mild

effect through its juice was prescribed to be utilised, the period involved in the offering at the third pressing must be a longer one, that is, through the night. Consumption of the juice of fresh shoots through the night would probably adversely affect the body and mind of the consumer. This practice of offering and consuming Soma throughout the night reminds one of the statement in several texts that "Some teachers prescribe Atirātra as the first sacrifice."³⁹ This practice would go back to the R̄gveda⁴⁰ which directly mentions the Atirātra sacrifice. Thus the old tradition of performing Soma-sacrifices commenced with the Atirātra as the first one which in early days may not be so complicated as the present one. When, in course of time, the Agniṣṭoma took the first place in the range of Soma-sacrifices with increasing numbers of Stotra-Śastras, the practice of employing the residue of Soma in the third pressing, once started with the Atirātra, was still retained in all of them.

Thus from the Yajurveda and the Brāhmaṇas we know the following facts about the Soma which render valuable help in identifying the plant: Soma was a plant, a perennial plant. It grew in mountains and was supplied by aborigines. It grew also in valleys and around the lakes. Other plants of similar appearance grew side by side with it. It had tawny shoots; their juice was astringent. It was pressed with the help of water and was mixed with milk. The mixture became fermented, and the libations were offered on the fire to deities and the remnants were consumed by the priests and the sacrificer. It was also mixed with boiled milk, curds and flour of parched barley. The eatables, namely, parched barley, flour of parched barley, cake, parched paddy and coagulated milk were offered side by side with the Soma-libations and the remnants were consumed. In the evening and throughout the night, the juice extracted out of the residue and mixed with milk was offered on the fire and remnants were consumed.

39. ĀpSS. 10.2.4: *atirātram eke pūrvam samāmananti / Satyś 7-1: atirātram eke prathamām yañnam adhiyate / Nidānasūtra 3.1.2: atirātram prathamām manya iti dhānamjayyaḥ athīpi śāśvad bahvṛcā atirātrīm eva prathamām adhiyate /*

40. RV. 7.103.7: *brāhmaṇāśo atirātre na some saro na pūrṇam abhito vadantah /*

In the event of the Soma being snatched away after it was ceremonially purchased, the Soma which had grown nearby was procured. Soma was said to be growing around Śaryaṇāvat lake even in the Rgvedic period (RV 8.64.11). Sāyana in his commentary on the Rgveda (1.84.14) says that Śaryaṇā was the name of a country (which is the present state of Haryana). In case Soma did not become available nearby, the substitute mentioned in the serial order was procured and the performance of the sacrifice was concluded with certain modifications. Subsequently, the sacrificer was again consecrated, Soma was procured and ceremonially purchased, and the formal Soma-sacrifice was performed. A sacrifice performed by employing a substitute was never regarded as a formal Soma-sacrifice.

HAOMA IN AVESTA

Side by side with the consideration of Soma in Indo-Aryan literature, it is pertinent to pay attention to the character of Haoma as reflected in Iranian literature. Just as there is the Soma-sacrifice prescribed in the Vedic literature, the Yasna ceremony is laid down in the Avesta. One finds authentic and detailed information concerning this ceremony in J. J. Modi's esteemed treatise.⁴¹ Below I collect such information from that book as would throw light on the problem under discussion.

In the Avesta we meet with four Haomas :

(i) Haoma the prophet (Yasna 9.11); (ii) Haoma the plant (Yasna 9.11); (iii) Haoma the hero (Yasna 11.7; Yasht 9.17; 17.37-38) and (iv) Haoma Khvarenangha (Yasht 13.116). Their special names are : Haoma Dūraosha, Haoma Zairī, Haoma Frāshmi and Haoma Khvarenangha. Haoma Dūraosha was a pious man belonging to the Peshdadian Dynasty. He had passed a good deal of his time in divine meditation on the Hukairyā peak of the lonely mountains of the Elburz. Before Zoroaster he was the first prophet to proclaim to the world the Mazdayashnian religion. He had his Gāthās. "It was this Haoma who gave his name to the plant which he seems to have discovered and to the Haoma ceremony which he is said to have introduced. According to the Yasht 10.7, he was the first man who produced the juice in the mortar (*hāvana*) on the Elburz mountain. It appears that, while absorbed in deep divine meditation in his retreat in the mountains, he discovered this plant growing on the heights and found it to be nutritious, health-giving and invigorating. He introduced it to the world as such; but in order to make it doubly efficacious, he instituted a form of ritual designed to absorb the mind of the people in holy and religious thoughts. A plant in itself health-giving and vigorous when partaken of under a partial inspiration of divine thoughts, was likely to be beneficial to the mind as well as to the body."

41. J. J. MODI, *The Religious Ceremonies and Customs of the Parsees*, Bombay, 1922.

"Haoma is a medicine-plant which grows in Persia and Afghanistan. It is a species of *Ephedra* (Nat. Ord. *Gnetaceae*). Mountains and mountain-valleys are mentioned as places where the plant grows luxuriously. In some passages Mount Elburz (called in the Avesta Hara Berezaite) is specially mentioned as its habitat. But it must be borne in mind that the name Elburz not only denoted the present Mount Elburz, a peak of the Caucasus, but was applied to the whole range of mountains extending from the Hindukush in the east to the Caucasus in the West. The Haoma is described as a plant with branches and sprigs, as possessing medicinal properties and as golden-coloured!"

"The religious or spiritual properties attributed to the Haoma plant are described in rich poetical style and in a tone overflowing with heart-felt admiration and praise. Haoma prepared and drunk in a state of pious spiritual inspiration is believed to give wisdom, courage, success, health, increase and greatness ... Haoma is specially sought for by young maidens in search of good husbands, by married women desirous of being mothers and by students striving after knoweldge. It affords special protection against the jealous, the evil-minded and the spiteful. It is a check upon the influence of women of loose character who change their affections as frequently as the wind changes the directions of the clouds. For all these reasons Haoma is called nmāna-paiti, vīs-paiti, zantu-paiti, danghu-paiti i.e. Lord of the house, the village, the district and the country."

"The qualifications which are required of the man who would drink Haoma with advantage are good thoughts, good words and good deeds, obedience to God and righteousness. On the other hand, Haoma curses those who are sinful and evil-disposed." "I Haoma who am holy and keeper away of death, am not the protector of the sinful." "May thou be childless, and may evil be spoken of thee".

"It appears from the Avesta that the Haoma ceremony was in existence as early as the time of the Peshdadian dynasty. It is as old as the time when the ancestors of the Parsees and the Hindus and even the ancient Romans dwelt together."⁴²

42. J. J. MODI, *op. cit.*, Pp. 301-305.

The Haoma ceremony falls under four heads :

(i) The preliminary preparations, (ii) the ceremony of purifying or consecrating the Haoma twigs, (iii) the ceremony of preparing and straining the Haoma juice, and (iv) the ceremony of drinking the Haoma juice. Modi has then described the Yasna ceremony in detail.⁴³

While in the Veda the word Soma has a two-fold meaning, plant or juice and God, in the Avesta it has four-fold meaning. The fourth meaning, Haoma Khvarenangha may be compared with the *Brāhmans* who performed Soma-sacrifices and consequently attained the heaven. We gather the following facts about Haoma from the Avesta: Haoma was a plant growing on mountains and in valleys, particularly on the Elburz mountains. It also grew near habitations. It was golden-coloured and had shoots. Its juice was mixed with cow's milk or goat's milk, and the mixture was consumed by the priests. Growing near human habitations, Haoma was being used for medicinal purposes. A comparison of the Soma-sacrifice and the Haoma ceremony is out of place here. Thus the information concerning the Haoma as gathered from the Avesta is fully in accordance with that of the Soma collected from the Rgvedic and post-Rgvedic literature.

43. J. J. MODI, op. cit., Pp. 306-329.

BOTANICAL FACTS

The evidence collected above from the Veda and Avesta clearly leads to the conclusion that Soma-Haoma was a plant. Wasson's claim that Soma was a mushroom, Fly agaric called *Amanita muscaria* does not stand. In the initial portion of his book, Wasson has said much about the shamanic use of *Amanita muscaria* in Eurasia, and has tried to extend the same practice to the ancient Indo-Iranians. But as Brough has said, that discussion "cannot even be adduced as confirmatory arguments for the theory that Soma was *A. muscaria*. Until this theory is proved for the R̄gveda, and proved beyond any possible doubt, the non-Indo-Iranian materials remain, in the strictest sense, irrelevant."⁴⁴ As Brough has pointed out, what was the necessity of pounding, as is done in the case of Soma-Haoma, when the Fly agaric could easily be eaten up?⁴⁵.

Wendy Doniger O'Flaherty has contributed Part II (pp.95-147) to Wasson's book called "The post-Vedic history of the Soma plant." In this part she has taken a review of the attempts made so far of identifying the Soma-plant. Before doing so she has given in a few pages, her assessment of the information which the Brāhmaṇas and Śrautasūtras in her opinion supply towards the solution of the Soma-problem. She says, "The Brāhmaṇas are much pre-occupied with the question of substitutes of Soma"(p. 96). As a matter of fact, the Brāhmaṇas have referred to the substitutes of Soma only when there was an occasion to speak about the various expiatory rites to be performed in the event of different contingencies. Otherwise they are concerned with the original Soma-plant, its juice, and the liquids with which it was to be mixed up for being used as a Soma-libation. Once these things were mentioned in connection with the basic Soma-sacrifice, it was superfluous to repeat them in dealing with the numerous subsequent Soma-sacrifices. O'Flaherty says, "If the priests knew what the Soma was, they

44. J. BROUH, *op. cit.*, Pp. 332-333.

45. J. BROUH, *op. cit.*, p. 338.

never stated it clearly, and their references to the Soma plant are ultimately of little help in establishing its botanical identity." (p. 96). As I have already said, the authors of the Brāhmaṇas and many of the Śrautasūtras had a definite knowledge of the original Soma plant. They had a correct knowledge of the *Soma*. How can we expect them to say about it in more definite terms so that we living in the twentieth century A. D. may be convinced about its identity?

As a conclusion of her study of the Brāhmaṇas and Śrautasūtras, O'Flaherty mentions the following pertinent facts (p. 97):.

1. "The colour red is consistently associated with the Soma-substitute. Red is the colour of *Nyagrodha* flower; the colour of the *Phālguna* plant; the colour of the acceptable *dūrvā* grass and even the colour of the cow used in the purchase of Soma."

2. "There is a clear distinction between the identity of Soma and the identity of the substitutes. For Soma one must look to the R̥gveda. For the substitutes the Brāhmaṇas are the earliest sources of importance, but they contain no passages about the authentic Soma of sure evidencial value. They are concerned with the ritual and symbolic nature of the Soma plant, not with its botanical identity."

About "the fact" No. 1, it must be said that the substitutes were characterised by the tawny colour (*aruṇa*), not the red, because the Soma-plant is described as of that colour. In prescribing the substitutes the authors of the Brāhmaṇas were mainly concerned with the colour, form and sappiness. Mention has been made of *Nyagrodha* 'flower'. - *Nyagrodha* (*Ficus Indica*) has no flowers; it has red berries. These berries are not mentioned in the Brāhmaṇas together with other substitutes; they are prescribed to be pressed as a substitute in the Rājasūya sacrifice in the Aitareya Brāhmaṇa. O'Flaherty was probably inclined to stress the red colour so as to provide background for the red Fly agaric.

Secondly O'Flaherty is inclined to distinguish between the two identities—of Soma and of substitutes. When the intention of the Brāhmaṇa authors was to prescribe the substitutes bearing similar external appearance, it is strange to differentiate the substitute and the original as two identities. O'Flaherty's

statement that "for Soma one must look to the R̄gveda. For the substitutes the Brāhmaṇas are the earliest source of importance" is totally unacceptable. We have seen that the Brāhmaṇas only corroborate the evidence of the R̄gveda and speak of the original Soma.

O'Flaherty has recorded the views of late Sanskrit works (Lexicographers, Suśruta Saṁhitā, Śabarasvāmin, Sāyaṇa), early European scholars, mid-nineteenth century writers, botanist George Watt, scholars after the turn of the century and latest researches in the twentieth century. It is needless to mention all the theories proposed by various scholars and botanists. About these O'Flaherty has remarked, "Some ingenious, some thoughtful, some obviously silly, some plausible, some vague, some stubbornly wrong-headed, some Procrustean, some groping towards the truth,—but all shots in the dark" (p.143). I would say that not "all" shots are in the dark.

Out of the several plants claiming to be Soma in the opinion of Vedists and botanists, three plants deserve consideration. O'Flaherty had also drawn pointed attention towards these (Pp.104-105). There is also a fourth claimant which may be considered at the outset. It is the wild rhubarb which grows in the mountains, has a fleshy stalk and can be made into rhubarb wine. Regel, Sir Aurel Stein, Karl Hummel and R. C. Zaehner advanced this theory. Stein⁴⁶ says that the description of the Soma plant could apply to rhubarb or any other plant, but in his opinion the description of the Soma-juice is best applied to rhubarb. He added that the juice might be mixed with milk to facilitate fermentation. This theory, however, need not be taken seriously because Regel himself stated that the natives did not use rhubarb to make a beverage. Another point going against rhubarb is that animals do not consume the leaves of rhubarb because they are toxic. According to Avesta (Yasna 9.26) Haoma is venerated as the lord of grazing animals.

46. Sir Aurel STEIN, "On the Ephedra, the Hum plant and the Soma", *Bulletin of the London School of Oriental Studies* 6/2, 1931, Pp. 501 ff.; O'FLAHERTY, Pp. 132-133.

Three Genera We now come to the three genera which, according to a number of scholars, lay claim to be identified with Soma. O'Flaherty has also mentioned these with peculiar stress and has given a sketch of these three together in a drawing (p. 105). They are : *Sarcostemma brevistigma*. *Periploca aphylla* and *Ephedra vulgaris*. She calls them substitutes of Soma. The claim of *Sarcostemma brevistigma* was advanced by European scholars since the last century, particularly because its character partly agrees to the description of Soma in the Vedic literature and also because in most of the performances of Soma-sacrifice which took place in India – particularly in the South, some species of this plant was and is used as Soma. It is a creeper, and the later Sanskrit authors described the Soma as a creeper.

The *Sarcostemma* cannot however be identified with Soma firstly because it does not grow indigenously in North Western India, Pakistan, Afghanistan and Iran. Soma is said to be a herb (*oṣadhi*), king of herbs, while *Sarcostemma* is a creeper. Soma is tawny while *Sarcostemma* is greenish gray. Soma-juice promoted health and was invigorative and exhilarating. The milky sap of *Sarcostemma* is injurious to health. Even though not mentioned as a substitute in the Vedic literature, it came to be used as a substitute for Soma, particularly in Southern parts of India when the original Soma could not become available and its knowledge was totally lost. The substitute was chosen in view of its form, colour and sappiness in which the plant roughly corresponded with the original Soma. The quality of juice was ignored.

Another genus is *Periploca aphylla*. The claim of this plant was put forth probably because it is a herb which grows at low altitudes on mountains in North West India and other regions. It however cannot be identified with Soma because it has no joints. The plant contains a milky juice which, on exposure to air, soon solidifies and forms a gummy substance which can be utilised as an ingredient of a chewing gum. The juice of the plant cannot be utilised for the preparation of an intoxicating liquor. The plant does not possess the divine therapeutic uses and economic uses attributed to Soma-plant. The follicles of *Periploca aphylla* contain seeds provided with tufts of hair for dispersal by wind. The fruit contains no fleshy portion which is eatable by birds and cannot be carried away and dispersed by birds. On mountains it grew probably mixed up with *Ephedra*. It was very likely that the

aboriginal person who was entrusted by some organiser of a Soma sacrifice to fetch Soma at a particular time, while collecting the *Ephedra*, inadvertently or even purposefully picked up also the *Periploca aphylla*. Therefore, at the ceremonial purchasing of Soma, it was customary to sift the Soma and remove the foreign material like *Periploca aphylla*. It was also customary to enquire with the Soma-seller whether his Soma was pure. *Periploca aphylla* has thus no claim to be identified as Soma. It is not clear why O'Flaherty was inclined to call it as a substitute of Soma. It is neither mentioned as a substitute in the Brāhmaṇas and Śrautasūtras nor is it used as a substitute anywhere.

Ephedra What remains is the third genus, namely, *Ephedra*. We have already seen the chief characteristics of Soma as mentioned in the Rgveda and the post-Rgvedic literature and in the Avesta. "The geographical distribution, diagnostic characteristics, therapeutic properties and the economic uses of Soma as mentioned in the Rgveda are exactly similar to those of Haoma given in Avesta."⁴⁷ N. A. Qazilbash, a botanist of Peshawar (Pakistan), made a cultural and botanical study of *Ephedra*. He was an authority on the subject and wrote several research papers in which he published the results of his analytical study of that plant, growing in different regions.⁴⁸ His considered view was that the genus *Ephedra* was the original Soma-Haoma, I may quote relevant passages from his valuable paper, "Ephedra of the Rgveda,"

47. N. A. QAZILBASH, "Ephedra of the Rgveda", *The Pharmaceutical Journal*, London, November, 1960.

48. N. A. QAZILBASH, "The story of Indian Ephedra", *The Pharmaceutical Journal*, January 4, 1947; "Some observations on Indian Ephedra", *Quarterly Journal of Pharmacy and Pharmaceutics*, XXI No.4, 1948, Pp. 475-487; "Medicinal Plants of West Pakistan", *The Pharmaceutical Journal* 87, July 22, 1961; "Pakistan Ephedra I", *Pharmaceutisch Weekblad*, 17, 1971; "Pakistan Ephedra II", *Pharmaceutisch Weekblad*, 19, 1971. Besides the two species mentioned above, the following species are particularly discussed in these papers: *E. nebrodensis*, *E. foliata*, *E. pendularis*, *E. sarcocarpa*, *E. gerardiana*, *E. saxatilis*, *E. destachyam*, *E. fragilis*. He collected the specimens of these species from different localities and studied their chemical constituents and percentage of alkaloids.

"In Hindukush and Suleman ranges and on the Iranian plateau *Ephedra pachyclada*, *Ephedra intermedia*, *Periploca aphylla* are frequently met with growing side by side. *Ephedra Pachyclada* and *Ephedra intermedia* are locally still known by the name of *Huma* and *Hum* in Herat and the tribal areas on the border of Iran ... The general morphological resemblance of *Periploca aphylla* with *Ephedra pachyclada* created much confusion. The presence of latex was wrongly attributed to Soma by most of the later Sanskrit writers. Rgveda has nowhere recorded that Soma plant contains any latex. *Ephedra pachyclada* which grows commonly and abundantly on the Pamir and extends all along the Hindukush, Saifed Koh and Suleman ranges is the Soma plant of the Rgveda. The same botanical species represents the Haoma of Avesta—the holy scripture of the Parsees. In Baluchistan and the adjoining territories, *Ephedra pachyclada* Boiss is locally known by the names of *Uma* and *Uman*. The local names owe their origin to the classical Haoma of Avesta. It is interesting to note that in parts of Kafiristan and Nooristan, bordering along the Western Frontier of the Chitral State of Pakistan, *Ephedra pachyclada* Boiss is still known by the name Soma. This region is inhabited by primitive people beyond the reaches of modern civilization. They are regarded as the direct descendants of the early Aryans. They still retain their primitive dress, customs, habits, and traditions The supply of Soma in early periods was made mainly from the Hindukush and the Saifed Koh ranges. There was regular trade of Soma with India and in exchange for Soma the traders would get cows. Increased demands by new converts to Vedic religion promoted the adulteration with suitable substitutes. *Periploca aphylla* was a common adulterant *Ephedra pachyclada* Boiss and *Ephedra intermedia* grow abundantly on Hindukush, Saifed Koh and Suleman ranges. It is common in Chitral, Baluchistan and Afghanistan"

"Soma (*Ephedra*) is a plant of great antiquity. It has been in use by Chinese herbalists for many centuries under the name of Ma-huang. This name is applied to the Chinese *Ephedra* growing in North China. Ma-huang like Soma also denotes more than one allied botanical species. It is interesting to note in this connection that in Khyber and other tribal areas lying along the Hindukush

range, *Ephedra pachyclada* Boiss and *Ephedra intermedia* Shrenk and Mey are known by the names of Ma-hu and Mawa. The local names appear to have common origin with the Chinese Ma-huang.”

“In Khyber and parts of Afghanistan crushed green twigs of *Ephedra pachyclada* Boiss are boiled with milk and used as an aphrodisiac. The light chocolate-coloured powder contained in the central part is mixed with butter and administered as a remedy for sexual weakness. The green shoots are utilised as a tanning material for curing goat and sheep skins. The ashes of the burnt stems and branches are mixed with tobacco and are made into an intoxicating tobacco powder which is applied to the gums at the base of the teeth. A decoction of fresh or dried crushed green branches taken with powdered black pepper is a popular home remedy for cough, cold, urticaria, itching and other skin troubles. A mercury preparation (*bhasma*) made with the juice of fresh green twigs of *Ephedra pachyclada* Boiss and *Ephedra intermedia* Shrenk and Mey is administered to old people for rejuvenescence by native alchemists in parts of Afghanistan and Baluchistan.”⁴⁹

I fully agree to what Qazilbash has said about the identification of Soma-Haoma. O’Flaherty has spoken rather lightly about the botanists in India—and is inclined easily to set aside their conclusions based on botanical researches and linguistic similarities. Among the names of Soma-Haoma in local dialects of the regions from India to Iran she has cited the words *um*, *umbur* mentioned by George Watt as applied to Afghan wild grapes. The word *umbur* which is derived from the Sanskrit *Udumbara*, meaning a berry in general, is different from the words derived from Soma-Haoma as quoted above. That the *Ephedra* is traditionally known by a word derived from Soma-Haoma by people living in the neighbourhood of the mountains on which *Ephedra* indigenously grows is of much significance. Due weightage must be given

49. N. A. QAZILBASH, “Ephedra of the Rgveda”, *The Pharmaceutical Journal*, London, November, 1960.

to this evidence.⁵⁰ The fact that *Ephedra* known by the term Ma-huang has a long cultural history in China, renders support to the claim of *Ephedra* being identified with Soma. The attempt to trace the Proto-Indo-Iranian 'pressing' to *méduh*-mead in Indo-European culture and to connect this ritual with the Eurasian Shamanic rite of Fly agaric is all guess-work; this is indeed to make a simple problem unnecessarily more difficult. I do not agree with Kuiper when he says that "the complexities of the problem should not indeed be underestimated,"⁵¹ As Brough said, we are not concerned with the shamanic practices prior to the Indo-Aryan and Iranian period.

Recently Harry Falk discussed the problem of the identification of Soma in a paper "Soma-the plant and its Connotations"⁵² He has identified Soma with *Ephedra* and has maintained that the sacrificial ritual throughout employed *Ephedra* as Soma. He has drawn attention to the adjective *jāgṛvi* "awake" applied to Soma in the Ṛgveda, and has rightly related it to the ritual-prescription of keeping awake throughout the night on the part of the sacrifice on the first Dikṣā-day in a Soma-sacrifice. As Falk has said, "Waking through the night, is comparable to a defeat of the demons of the night, the demons of sleep and implicitly of death" (p. 4) The adjective *Jāgṛvi* applied to Soma and consequently to *Ephedra* is in consonance with the offering of Soma throughout the night as prescribed in the

50. Vaidyabhushan Ganesh Shastri Joshi, a well known Ayurvedist of the last generation in Pune introduced a syrup called *somāsava* by using a herb locally known as Soma in the Himalayan regions beyond Haradvar in Uttar Pradesh. It is prescribed in the same symptoms in which Ephedrine is prescribed. The chemical analysis of the herb showed that it was *Ephedra vulgaris*. Relying on the information available in Ayurvedic texts, S. Usman Ali and others have identified Soma with *Ceropogia juncea* Roxb., a plant which is used as Soma by Ayurvedists in Kerala (cf. the monograph: *The Soma: Its botanical identity and Pharmacognostic Anatomy*). They have not recognised the claim of the *Ephedra* species which, according to their information, "are not used for any other purpose excepting for mud rooting and burning as fuel. These plants are called Bandak and nowhere as Soma or Haoma".

51. KUIPER, I-J XII, p. 279.

52. H. FALK, "Soma - the plant and its connotations", *Abstracts, VIIth World Sanskrit Conference*, Leiden, 1987, p.48. I thank Dr. R. N. Dandekar for having made available to me a copy of the paper.

Atirātra sacrifice and discussed earlier. Since Indra kills sleeping Vṛtra obviously at night and places the sun in the sky, Falk has sought to prove that at least a considerable number of the hymns of the Rgveda were composed at night. He has cited in support RV 2.28 and 5.77. Even if the Ṛṣi speaks about the night it need not be inferred that he composed the hymns at night. The poet could easily eulogise the deeds being performed by a deity at night by composing his poems by day. RV 2.28 is addressed to Varuṇa and 5.77 to the Aśvins—the deities related to night in some way.

Concerning the recourse to substitutes for Soma, Falk argues, “Since the content in Ephedrine disappears rapidly when the plant is brought into humid areas, it becomes understandable why the Indian priests in course of time had recourse to substitutes; it would have been impossible to explain to any one the superior quality of the drug” (p.8)

This reason for resorting to substitutes for Soma is not convincing. As has already been shown, the priests living in the Brāhmaṇa-period and even the Sūtra-period had knowledge of the original Soma, and they generally employed it in their sacrificial performances. The substitution was incidental. Qazilbash has pointed out in several of his papers on the industrial use of *Ephedra* in Pakistan that large quantities of *Ephedra* are procured from mountainous regions, are brought to the plains, Ephedrine is extracted out of the plants and is exported to foreign countries. He has not even hinted at the rapid disappearance of Ephedrine from the plants in the process of extraction.

While speaking about the parts of fig-trees providing substitute for Soma, Falk says, “At least the Aśvattha seems to replace Soma already in the RV-stanzas from two hymns of the late first and tenth books may be interpreted in this way” (p.10). When original Soma was known in the Brāhmaṇa and even in the Sūtra period, it does not stand to reason to think of the replacement of Soma in the Rgvedic period itself. The interpretation of the relevant stanzas from such hymns will have to be sought in the light of this fact. The words *amṛta* and *madhu* which are employed in respect of Soma may be found used in connection with fig-fruits in a different context. The Aśvattha played a major role in the religious life of Indus culture which influenced the life of Indians in the period of the Yajurveda and the Brāhmaṇas, it is possible that even though the Aśvattha did

not replace the Soma i. e. *Ephedra* in the sacrificial religion, its influence in the religious life had begun to be felt even in the late Rgvedic period.

A century has elapsed since the problem of the original Soma-Haoma came up for discussion. Our knowledge of the Vedic religion and of the botany of the plants in question has much advanced in recent times. Consequently the problem has not remained difficult of solution. As discussed in these pages, the genus *Ephedra* with all its species is the only plant which rightly claims to be identified with Soma-Haoma. Several scholars and botanists have arrived at this conclusion.

The Iranians used *Ephedra* as the Haoma. So long as they lived in Iran, there was no question of using any substitute since *Ephedra* was easily available to them. The problem arose when the Parsees left Iran and settled on the West coast of India. The Parsees who were living in Bombay and Gujarat used to import *Ephedra* from Iran. They did so until the end of the last century.

In the Rgvedic period the Indo-Aryans lived in North-West India, Punjab and the regions between the rivers Ganga and Yamuna. They procured *Ephedra* for their sacrificial purposes from the mountains of North-West India. In the period of the Yajurveda and the Brāhmaṇas the Vedic Aryans had extended towards the east and the south. Even then they had the knowledge of *Ephedra* and procured the plant from the north-western parts. In case the *Ephedra* (Soma) procured for sacrifice was snatched away, they procured the *Ephedra* which was available at the nearest place and concluded the sacrifice. If the plant was not available nearby, they finished the sacrificial performance with certain modifications by procuring and offering one of the substitutes mentioned in the Brāhmaṇas. They again procured the original Soma and performed the Soma-sacrifice in a formal manner. When the people migrated still more towards the east and the south, it was practically impossible to procure the original Soma. Consequently the knowledge of the *Ephedra* was lost, and the sacrificers started using some species of *Sarcostemma* which was available to them. This might have happened probably in the fourth or fifth century A. D., when the later Srautasūtras were

composed. This may be inferred from the fact that these Sūtra - texts do not refer to the contingency of the purchased Soma being snatched away and original Soma not being available nearby.⁵³

53. DR. N. A. QAZILBASH, Professor of botany, Peshawar University, Peshawar (Pakistan) made a detailed botanical study of the various species of *Ephedra* and continued it even after his retirement from the professorship. He was convinced that *Ephedra* was the Soma of the Rgveda and Haoma of the Avesta. He proposed to write a monograph on the subject and sought from me information from the Vedic literature. He supplied to me botanical information on the *Ephedra*. We exchanged correspondence for three years (1976-1979). He could not write his monograph and unfortunately expired in 1983. I take this opportunity of paying my homage to his memory.

Some more evidence supporting the identification of Soma with *Ephedra* may be pointed out. Sir Aurel STEIN ("On Ephedra, the Hum plant and the Soma", *Bulletin of the School of Oriental Studies*, VI, London, 1932, p. 502) discovered a small cemetery in Central Asia where the dead appeared to be pure Aryans. He describes : 'the bodies were enveloped in a shroud of coarse canvas which in the case of the two best preserved burials had its edge near the head tied with two little bunches. One contained wheat, the other small broken twigs. The contents meant to represent provisions for the dead in another life. The twigs were found to be fragments of *Ephedra*. In another piece of evidence Sir John MARSHALL (*Taxila*, III, 1951, figure No. 67) has reproduced a picture which depicts the Buddha with a halo of the immortalising herb, receiving a bunch of herbs, namely, *Ephedra* from a herbalist. (cf. S. MAHDIHASSAN. "The popularity of the Soma plant at the beginning of Alchemy", *Indian Journal of History of medicine*, VII (2), December 1962, Pp. 26-36).

WORD-INDEX

aboriginal person 25.
ādāra 11, 12.
Āditya cup 15.
Ādhavanīya 15.
Afghanistan 19, 24, 26, 27.
Afghan wild grapes 27.
Agnihotra-offering 13.
Agniṣṭoma 5, 11, 15, 16.
Agniṣṭomastotra 13.
Ahīnas 5.
Aitareya Brāhmaṇa 22.
Ali,S. Usman 28.
alkaloid 2.
Amanita muscaria 1, 21.
Amṛta 29.
Āndhigava Sāman 13.
Anuṣṭubh 13.
Āpastamba 8, 10, 11, 13.
aphrodisiac 27.
Ārbhavapavamāna 13.
arjuna 11, 12, 13.
aruṇa 3, 22.
ashes 27.
Āśvalāyana 11, 14.
Āsvattha 29.
Āsvins 29.
Atharvaveda 4.
Atirātra 16, 29.
Avabhr̥tha 12, 13.
Avesta 18, 19, 20, 21, 23, 25, 26, 31.
babhru 3.
Bālhika 4.
Baluchistan 26, 27.
Bandak 28.
barley-flour 3.
Baudhāyana Dvaidhasūtra 8.

Baudhāyana Śrautasūtra 8.
berries 22.
berry 27.
Bharadvāja 13.
bhasma 27.
Bodhāyana 8, 13.
boiled milk 11, 12, 15, 16.
Bombay 30.
Brāhmaṇācchaṁsin 13.
Brāhmaṇas 1, 4, 5, 7, 9, 10, 14, 16, 21, 22, 23, 25, 29, 30.
Brough, J. 2, 21, 28.
Buddha 31.
bullock-cart 8.
bull's hide 14.
burnt stems and branches 27.
butter 11.
cake 16.
Caucasus 19.
Ceropegia juncea 28.
China 28.
Chinese herbalists 26.
Chinese Ma-huang 27.
Chinese *Ephedra* 26.
Chitral State 26.
chocolate-coloured powder 27.
coagulated milk 16.
cold 27.
colour 22, 24.
cough 27.
cows 22, 26.
cow's milk 20.
creeper 24.
curds 3, 11, 12, 15, 16.
curing, 27.
Dakṣinā 12, 13
danghu-paiti 19.
demons of night 28.
dīkṣā 7.
Dīkṣā-days 8, 14.

- Nikşanîyeşti 8.
 ā 12, 22
 3.
 na pitchers 14.
 Eka. 5.
 Elburz 18.
 Elburz mountain 20.
Ephedra 2, 19, 25, 28, 29, 30, 31.
Ephedra intermedia 26, 27.
Ephedra pachyclada 26, 27.
Ephedra vulgaris 24.
 Ephedrine 28, 29.
 Eurasian shamanic rite 28.
 European scholars. 23.
 Falk, Harry 28, 29.
 fermentation 15, 23.
 fermented 15, 16.
Ficus Indica 22.
 fig-fruits 29.
 fig-trees 29.
 flour of parched barley 15, 16.
 Fly agaric 1, 21, 22, 28.
 form 22, 24.
 fresh milk 11, 12.
 Ganga 30.
 Gāthās 18.
 genus 24.
Gnetaceae 19.
 goat's milk 20.
 goat skins 27.
 gruel 3.
 Gujarat 30.
 Haoma 1, 18, 19, 20, 21, 23, 25, 26, 27, 30, 31.
 Haoma Ceremony 19, 20.
 Haoma Dūraosha 18.
 Haoma frashmi 18.
 Haoma Khvarenangha 18, 20.
 Haoma Zairi 18.
 Hara Berezaite 19.

- harit* 3.
 Haryana 17.
 Haug, Martin 1.
 hāvana 18.
 Herat 26.
 herb 24.
 Hillebrandt, A. 1, 3, 5, 6, 9.
 Hindukush 19, 26.
 Hindus 19.
 hot milk 15.
 Hukairyā peak 18.
Hum 26.
Huma 26.
 Hummel, Karl 23.
 Indo-Aryans 30.
 Indra 29.
 Indus culture 29.
 intoxicating liquor 24.
 Iran 24, 26, 30.
 Iranian literature 18.
 Iranian plateau 26.
 Iranians 30.
 itching 27.
jāgr̥vi 28.
 Jaiminīya Brāhmaṇa 10, 12, 13.
 joints 24.
 Kafiristan 26.
 Kāṭhaka Saṃhitā 10, 11.
 Kātyāyana Śrautasūtra 14.
 Keith, A. B. 3.
 Kerala 28.
 Khyber 26, 27.
 Kuhn 6.
 Kuiper, F. B. J. 2, 28.
Kuśa 12.
lājā 8.
latex 26.
 lexicographers 23.
 Macdonell, A. A. 3.

- madhu* 29.
mahāvṛṣa 4.
 Mahdihassan. S. 6, 31.
 Ma-hu 27.
 Ma-huang 26, 28.
Maitrāyaṇī Saṃhitā 10.
Mānava 10, 11, 13.
 Manthi cup 15.
 Marshall, Sir John 31.
 Mawā 27.
 Mazdayashnian 18.
 mead 28.
médu 28.
 mercury preparation 27.
 midday-pressing 15.
 milk 3, 15, 16, 27.
 milky juice 24.
 milky sap 24.
 Mitra-Varuṇa 15.
 Modi, J. J. 1, 18.
 morning pressing 14.
 mortar 18.
 Mount Elburz 19.
 Mūjavat 3, 4, 7.
 mushroom 1, 2, 21.
 night 29.
nmāna-paiti 19.
 Nooristan 26.
 North China 26.
 North-Western India 24, 30.
Nyagrodha flower 22.
 O' flaherty, Wendy Doniger 21, 22, 23, 24, 25, 27.
 Oldenberg 1.
Oṣadhi 3, 24.
 Pakistan 6, 24, 25, 26, 29.
 Pamir 26.
 parched barley 8, 16.
 parched paddy 16.
parṇa 13.

- Parsees 19, 26, 30.
pāyasam annam 8.
Periploca aphylla 24, 25, 26.
 Persia 19.
 Peshawar 6, 25, 31.
 Peshdadian dynasty 18, 19.
phālguna 11, 12, 13, 14, 22.
 post-Ṛgvedic literature 25.
 Prācīnavamśa-hall 8.
 Proto-Indo-Iranian 28.
 Punjab 7, 30.
Pūtabhṛt jar 15.
pūtīka 11, 12, 13, 14.
 Qazilbash, N. A. 6, 25, 27, 29, 31.
 Rājasūya 22.
 Rathantarapṛṣṭha 11.
 red 22.
 Regel 23.
 Renou 6.
 residue 15, 16.
 Ṛgveda 1, 3, 5, 6, 16, 17, 21, 22, 23, 26, 28, 29, 31.
 Ṛgvedic hymns 1, 3.
 Ṛgvedic verses 2, 3.
 rhubarb 23.
 rice cooked in milk 8.
 Rjīka 3.
 Romans 19.
 Roth 6.
 Śabarasvāmin 23.
 Śād 13.
 Saifed Koh 26.
 Sāmaveda 12
 sappiness 22, 24.
Sarcostemma brevistigma 24, 30.
 Śaryaṇāvat 3, 17.
 Satapatha Brāhmaṇa 10, 12, 14.
 Sattras 5.
 Satyāśāḍha 10, 11, 13.
 Sāyana 17, 23.

- sexual weakness 27.
 shamanic practices 28.
 sheep skins 27.
 shoots 3, 7, 8, 27.
 skin troubles 27.
 Soma-juice 15.
 Soma-libation 21.
 Soma-shoots 14, 15.
 Spiegel 1.
 Śrautasūtras 1, 4, 9, 10, 11, 13, 14, 21, 22, 25, 30.
 Śrāvantiya Sāman 13.
 stein, Sir Aurel 23, 31.
 substitutes 22, 23, 24, 25, 26, 29.
 Suleman ranges 26.
 sun 29.
 sunset 15.
 Suśruta Saṃhitā 23.
 Sutyā-days 14.
 Śyenahṛta 12.
 Taittirīya 10.
 Taittirīya Brāhmaṇa 11, 13.
 Takman 4.
 Tāṇḍya Mahābrāhmaṇa 10, 12, 13.
 tanning material 27.
 tawny 3.
 tawny colour 22.
 tawny panicles 13.
 Third pressing 15.
 tobacco 27.
 twigs 31.
 udumbara 27.
 um 27.
 uma 26.
 uman 26.
 umbur 27.
 urticaria 27.
 Vaikhānasa Śrautasūtra 13.
 Vāravantīya sāman 13.
 Varuṇa 29.

- Vasatīvarī water 14.
Vikhanas 8.
vis-paiti 19.
Vṛtra 29.
Wasson R. Gordon 1, 2, 3, 5, 6, 21.
watt, George 23, 27.
Watt, coast of India 30.
Western frontier 26.
wheat 31.
woollen filter 15.
Yajñāyanjñya 'śaman' 13
Yajurveda 1, 3, 5, 7, 12, 16, 29, 30.
Yamuna 30.
Yasna ceremony 1, 18, 20.
Zantu-paiti 19.
Zaehner, R. C. 23.
Zoroaster 18.

BIBLIOGRAPHY

- Aalto, P. 'Madyam apeyam' (Sanskrit). *Nobel Comm.* Vol., 1959, 17-37.
- Agrawal, Manju. 'Śiva-Śivā tathā jagat kī agniśomātmakatā' (Hindi). *ŚPP* 18 (2) – 19 (1), 1977-78, 30-39.
- Agrawala, V. S. *India as known to Pāṇini*. Lucknow, 1953.
- 'Soma' (Hindi). *Chatrika Abhinandana Grantha*. Amritsar, 1950, 1-4.
- Aitchison, I. E. T. 'On the Flora of the Kurram Valley.' *J. Linn. Society* Vol. 18, 1880; Vol. 19, 1882.
- 'The Botany of the Afghan Delimitation Commission.' *Transactions of the Linnean Society*, 1887.
- Andreaszky, G. 'Beitrag zur der Nordafrikanischen Arten der Gatung Ephedra. *Botanische Jahrbuch* 64, 1931.
- Āpastamba-Śrauta-Sūtra, edited by R. Garbe with Rudradatta's commentary. *Bibliotheca Indica* Parts I-III, Calcutta, 1882-1902.
- Apte, V. M. 'An investigation into the nature of *Vena*, the Deity of the Ṛgveda-Hymn X. 123.' *BDCRI* vi (1-2), Dec. 1944.
- Āśvalāyana-Śrauta-sūtra with Gārgya-Nārāyaṇa-vṛtti. Ānandāśrama Sanskrit Series, Pune.
- Atharvaveda Saṁhitā, edited by Pandit S.D. Satavalekar, Aundh (Satara), 1938.
- Avesta, edited by K.F. Geldner.
- Bailey, Sir Harold W. 'A half century of Irano-Indian studies.' *Journal of Royal Asiatic Society* 2:99-110, 1972.
- Bal, S. N. 'Some Commercial Aspects of Indian Ephedra.' *Indian Journal of Pharmacy* 15, 1953.
- Baudhāyana-Śrauta-Sūtra, edited by W. Caland. *Bibliotheca Indica*, Calcutta, Parts I-III.
- Benveniste, Émile. 'Phraséologie poétique de l'indoiranien.' *Renou Comm.* Vol., 1968, 73-79.
- Bilimoria, N. F. *Zoroastrianism in the light of Theosophy*. Bombay, 1896.
- Bloomfield, M. 'The myth of Soma and the eagle.' *Festschrift*

- Roth*, 1893, 149.
- 'Contributions to the interpretation of the Veda.' *JAOS* XVI,1.
 - Boissier, E. *Flora Orientalis* Vol. V.
 - Boyce, Mary. 'Haoma, Priest of the Sacrifice.' *W. B. Henning Memorial Volume*, 1970.
 - *Zoroastrians, their religious beliefs and practices*, 1979.
 - Brandis, D. *Indian Trees*. London, 1906.
 - Brough, J. 'Soma and *Amanita muscaria*.' *BSOAS* XXXIV Part 2, London, 1971.
 - Brown, W. Norman. 'Proselytising the Asuras.' *JAOS* 39, 1919.
 - Byck, R; Freud Sigmund. *Cocaine Papers*. Stonehill publications Co., New York.
 - Cahen, P. 'Ephedra through the Ages.' *Ind. Forester* 71, 1948.
 - Chamberlain, C. J. *Methods in Plant Histology*. Chicago, 1924.
 - Chaudhri, I.I. 'Pakistani Ephedras.' *Econ. Botany* 11, 1957.
 - Chen and Schmidts. *Ephedrine and Related Substances*. 1930.
 - Chopra and Dutt. *Indian Journal of Medical Research*. 17, 1930.
 - Chopra, R. N.; Nayar S. C.; Chopra I. C. *Glossary of Indian Medicinal Plants*. 1956.
 - *Indigenous Drugs of India*. 1958.
 - Darlington, C. D. *Recent Advances in Cytology*. Calcutta, London, 1937.
 - De Gubernatis, A. *La mythologie des plantes* (etc.). 2 Vols. Paris, 1878-1882. Notamment, *le Soma* II 351.
 - Devanathacharya, N. S. 'Guṇavidhiḥ' (Sanskrit). *Journal of the Tanjore Saraswati Mahal Library* 34 (3), 1971, SK. 1-6.
 - Dubreuil, G. J. 'Soma.' *IA*, 1926.
 - Dwivedi, R. N. 'Drinking in ancient India : abandon and injunctions.' *Śaṁ. Vim.* 2 (1), 1974, 4-8.
 - Dymock; Warden; Hooper. *Pharmacographia indica*.
 - Engler-Prantl. *Pflanzenfamilien*.
 - 'Ephedra'. *Bulletin Imperial Institute* 36, 1938.
 - Falk, Harry. 'Soma : the plant and its connotations.' *Proceedings of the World Sanskrit conference*, Leyden, 1988.
 - Farnsworth, N. R. 'Treasure-house of herbs.' *World Health*, June, 1983.
 - Fateh Singh. 'Agni and Soma : The Soma, celestial and terrestrial.' *PO* 3-5, 1938-40.

- Feng and Road. *Chinese Journal of Physiology*, 1928.
- Fischer and Meyer. 'Ephedra.' *Procera India X. Host. Bot. Patrop* 45, 1844.
- Fowler, Murray. 'The Role of Surā in the Myth of Namuci.' *JAOS* 62, 1942.
- Geden, 'Devayāna-Jolly. 'Expiation and atonement (Ind.); Gait. 'Human sacrifice' (Ind.); Keith. Marriage (Hind.); Keith Ordeal (Hind.); Jolly. Purification (Hind.); Hopkins. 'Soma'; Jolly. Vows (Hind.); Hillebrandt. 'Worship (Hind.)'; *ERE*. passim.
- Geitter, L. *Österr. Botan. Z.* 78, 1929.
- Geldner, K. F. *Der Rgveda*. Harvard Oriental Series Vol. 33, 1951.
- Gershevitch, Iya. 'An Iranist's view of the Soma controversy.' *Memorial Jean de Manasce*. Fondation Culturelle in Iranienne, Louvain, 1974, 45-75. (Also. *SP 29 ICO*, Sect. 5, Paris, 1973, 113-114).
- Ghose, Aurobindo. 'The God of Mystic Wine.' *Arya* III, 1916-17.
- Ghosh, T. P.; Krishna, S. 'Jahreszeitliche Veränderung des Alkloidgehalts der Indischen Ephedra Arten.' *Arch. Pharm.* 268, 1930.
- Gonda, Jan. *Vedic Rituals*.
- Griffith, R. T. H. *Hymns of the Rgveda*, 1889.
- Gubernatis, *La Mythologie des plantes*.
- Gupta, B.; Bal S. N. 'Pharmacognosy of Indian Ephedras.' *J. Sei. Ind. Res. (India)* 11 B (6); 1952.
- Hall, A. D. 'An outline of Cytological Technique for Plant Breeders.' *School of Agriculture*, Cambridge, 1937.
- Hartwich, C. 'Fliegenschwamm.' *Die menschlichen Genussmittel*, Leipzig, 1911.
- 'Soma-Haoma.' *Die menschlichen Genussmittel*, Leipzig, 1911.
- Haug, Martin. *Essays on Sacred Language, Writings and Religion of Parsees*, London, 1862.
- Havell, E. B. 'What is Soma?' *JRAS*. 1920, 349.
- Hegneuer, R. *Chemotaxonomie der Pflanzen* Vol. I, 1962.
- Henry, V. 'Soma et Haoma, le breuvage d'immortalité dans la mythologie, le culte et la théologie de l'Inde et de la Perse.' Conf. Guimet (1907) — *Ann. Guimet, Bibl. Vulgaria.*, XX

- 51.
- Hertel, J. 'Das indogermanische Neujahrsopfer im Veda.' *Berichte über die Verhandlungen der sächsischen Akademie der Wissenschaften zu Leipzig*, neuzigster Band. Leipzig, 1938.
- Hillebrandt, A. *Vedic Mythology*. Delhi, 1980.
- Hooker, J. D. *Flora of British India*. 1872-1897; Vol. 5, 1885.
- Hopkins, E. W. 'Soma.' *ERE XI*, 685.
- Hu, Shiu-Yeng. *Indian Pharmaceutical Codex*. New Delhi, 1953.
- 'Ephedra (Mahuang) in the New Chinese Materia Medica.' *Econ. Botany* 23, 1969.
- Hummel, Karl. 'Wissenswertes für die pharmazeutische Praxis.' *Archiv der Pharmazie* 292/64 Band, Mitteilungen, Heft 4, Weinheim, April 1959.
- Hyatt, Richard. *Chinese Herbal Medicine*. London, 1978.
- Irving, T. B. 'Introduction to Noble Reading.' *Hamdard Islamicus* 3 (2), Karachi, 1980.
- Jaiminīya Brāhmaṇa*, edited by Lokesh Chandra, Delhi.
- Joshi, Lakshmana Shastri. *Prācīna Bhāratīya saṃskṛtitīla madyaviṣayaka ācārasaṃhitā*. (Marathi). *Navabhārata* 31 (8), 1978, 5-8.
- Jouveau-Dubreuil, G. 'Soma.' Transl. by Sir R. Temple. *IA LV*, 176.
- Kamboj, Jiya Lal. 'Analogy in change of meaning with special reference to Sanskrit.' *SP, AIOC* 28, Dharwar, 1976, 131-132.
- Kapadia, B. H. 'A critical interpretation and investigation of epithets of Soma.' *Vallabh Vidyanagar*, 1959.
- Karlgren, B. *Analytic Dictionary of Chinese*, Paris, 1923.
- Kashikar, C. G. *A Critical Analysis of the Vedic Sacrificial Religion*. (Marathi). Pune, 1974.
- 'Antecedents of the Vedic Soma.' *Hamdard XXIII* (1-2), Karachi, 1980.
- Kāthaka Saṃhitā*, edited by L. V. Schröder.
- Kātyāyana-Śrauta-Sūtra*, with Vidyadhar Gauda's Commentary, Varanasi.
- Keith, A. B. *Religion and Philosophy of the Veda and Upanishads*. Harvard Oriental Series 31, Cambridge, U. S. A.

- Kennan, George. 'Zeltleben in Sibrien.' Übersezt von D. Halk, Leipzig, *Reclamasche Bibliotheca*.
- Khattak, G. M. 'Ephedra in Baluchistan.' *Pakistan J. Forestry* I, 1951.
- Kooger, J. P. 'The Mystery of the sacred plant of the Indo-Iranians.'
- Kosteletzky. *Med. pharm. Flora* Band I, 1831.
- Kölver, Bernhard. 'Kashmirian traces of ancient oath ceremonies.' *GSI* II, 1976, 131-145.
- Kowl, Indrew. *High Times Encyclopaedia of Recreation Drugs* Stonehill Publications Co., New York.
- Krause, E. *Tuisko-Land*, 1891.
- Krishna and Ghose. *J. Soc. Chem. Ind.* 48, London, 1929.
- *Ind. For. Rec.* Vol. 16, 1931.
- Kṛṣṇa Yajurveda Taittirīya Saṁhitā*, edited by Pandit S. D. Satavalekar. Pardi (Surat), 1957.
- Kuiper, F. B. J. *IJJ* XIII, 1970.
- 'Four word-studies.' *IJJ* 15 (C 30,) 1973, 179-204.
- Kulikowski, D. 'Examen du mythe véd. du faucon porteur du soma.' Odessa, 1883 En russe IV, 26-27.
- Langlois, A. *Mémoire sur la divinité védique appelée soma*. Paris, 1852.
- Lewin. *Lehrbuch der Toxicologie*, 1897.
- Lindner, Paul. 'Das Geheimnis um Soma, das Getränk der alten Inder und Perser.' *Forschungen und Fortschritte* 9, 1933.
- Lommel, H. 'Soma.' *Forschungen und Fortschritte* 11, 1935.
- Macdonell, A. A. *Vedic Mythology*. Grundriss der Indo-Arischen Philosophie und Alterthumskunde. Band III, 1887.
- Macdonell, A. A. & Keith A. B. *Vedic Index of Names and Subjects*. London, 1912.
- Macheck, V. 'Origin of the Aśvins.' *Arch. Or.* 15, 413-19.
- Mahdihassan, S. 'Alchemy in the light of its names in Arabic, Sanskrit and Greek.' *Janus* 49, 1961, 79-100.
- 'Elixir, its significance and its origin.' *Journal of the Asiatic Society of Pakistan*, Dacca, 1962.
- 'The Popularity of Soma plant at the beginning of Alchemy.' *Indian Journal of History of Science* Vol. VII (2), 1962.
- 'Identifying Soma as Ephedra.' *Pakistan Journal of Forestry* 13

- (4), 1963.
- 'Alchemy as descending from herbalism or Kimiya versus Soma.' *Scientia* Vol. 56, June, 1964.
 - 'Soma of the Aryans and the Chah of the Chinese.' *May and Baker Pharmaceutical Bulletin* 21 (3), 1972.
 - 'The earliest distillation units of pottery in Indo-Pakistan.' *Pakistan Archaeology* 8, Karachi, 1972.
 - 'Soma in the light of comparative Pharmacology, Etymology and Archaeology.' *Janus* 61, 1974.
 - 'The Vedic words Soma and Surā traced to China.' *Hamdard-Medicus* Vol. XXI (12), 1978.
 - 'The Biography of Soma.' *Hamdard-Medicus* 23 (3-4), Karachi, 1980.
 - 'Haoma of Irano-Aryans as the medicinal plant *Ephedra*.' *Hamdard-Medicus* 24 (3-4), Karachi, 1981.
 - 'Hum or Ephedra as mentioned by Al-biruni.' *Hamdard-Medicus* XXIV (3-4), Karachi, 1981.
 - 'Evolution of *Ephedra* as the Soma of the Rgveda.' *Ancient Science of Life* 2 (2), 1982; *Vivekananda Kendra Patrika*, Madras, 1983.
 - 'The precise natures of the Vedic drinks Soma, Surā and Parisrut.' *Studies in History of Medicine* 6 (4), 1983.
 - 'Etymology of names Ephedra and Cannabis.' *Studies in History of Medicine* 7 (1), 1983.
 - 'The epithet Red in Rigveda as connoting immortality. A study of Soma.' (Part I). *Studies in History of Medicine* 7 (3-4), 1983.
 - 'Identifying the Soma plant as ephedra from Rgveda and Avesta.' *Hamdard-medicus* 26 (3), Karachi, 1983.
 - 'Soma juice as administered to a newly born child being mentioned in Rigveda.' *American Journal of Chinese Medicine* 11 (4), 1983.
 - 'Studies in History of Medicine.' (Dedicated to Hakeem Abdul Hameed) (Nine Articles). New Delhi, 1984, 93-153.
 - 'Soma as Energizer-cum-euphoriant, versus Surā as intoxicant.' *Ancient Science of Life* III (3), 1984.
 - 'A Persian Painting illustrating ephedra leading to its identity as Soma.' *Journal of Central Asia* 8 (1), 1985.
 - *The History And Natural History of Ephedra As Soma.*

- Islamabad, 1987.
- Mahdihassan, S. and Fatima Sultana Mehdi. 'Ephedra : the oldest medicinal plant supported by literary references and as still in use.' *Studies in History of Medicine* 8 (3-4), 1984.
- Mahdihassan, S. and S. Itaat Ali. 'A comparative study of *Ficus Religiosa*, of ephedra as Soma and its two substitute plants.' *Hamdard-Medicus* 29 (1-2), 1986.
- Maitrāyaṇī Saṁhitā*, edited by L. V. Schröder.
- Mānava-Sākuta-Sūtra*, edited by J. M. v. Gelder. New Delhi, 1961.
- Marshall, Sir John. *Taxila*.
- 'The Buddhist art of Gandhara', 1910.
- Martindale, William. *The Extra Pharmacopeia*, 1977.
- Masucci, P.; Suto, Ko. *Journal of the American Pharmaceutical Association* 15, 1926.
- Max Müller, F. *Physical Religion*, 1891.
- 'The Soma Plant.' Acad. 1884, 274.
- Mehra, P. N. 'A study of the Karyotypes and the occurrence of deploid male Cametophytes in some species of the genus Ephedra.' *Proceedings of the National Academy of Sciences*, 16 (5 & 6), India, 1946.
- Mills, L. H. (ed.) *The Zend Avesta. SBE IV, XXIII, XXXI*, 1887.
- 'The Avestic h(a)oma and the Vedic soma.' *As. Rev.* VIII (23), 1916.
- Modi, J. J. *The Religious Ceremonies and Customs of Parsees*. Bombay, 1922.
- Morgenstierne, Georg. 'A Vedic word in some modern Hindukush languages.' *Sarupabharati*, Hoshiarpur, 1954.
- Moser, C. 'The Flower of Paradise.' *National Geographical Magazine*, August, 1917.
- Mukherjee, B. L. 'The Soma plant.' *JRAS* 1921, 241.
- 'The Soma plant.' *Bull. Rationalistic Soc.*, Calcutta, 1922.
- Mukherjee, Biswanath. 'Pavamāna Soma.' *Journal of Oriental Institute* 28, 1979.
- Mukhopadhyay, B. 'On the significance of Soma.' *Vishweshwaranand Indological Journal XVI* (1), Hoshiarpur.
- Müller, R. F. G. 'Eigenwertungen in altindischer Medizin.' *Nova*

- Acta Leopoldina 20, Halle.
- Nakayama, S. *The empirical tradition of Science and Technology in China*, 1973.
- Narasimhacharya, S. *A true interpretation of Vedic Sacrifice*. Mylapore, 1932.
- Nasir, E. etc. 'Gymnosperms of West Pakistan.' *Gordon College*, Rawalpindi.
- Oldenberg, H. *Die Religion des Veda*. Berlin, 1894.
- 'Vedische Untersuchungen.' *ZDMG* LIV, 57.
- Parker, R. N. *A Forest Flora for Punjab with Hazara and Delhi*, 1956.
- Pavgee, N. B. 'Soma-juice is not liquor.' *Or. conf.* 3, 1870. *The indigenous far-famed Soma and the Aryan autochthones in India*, Poona, 1921.
- Pott, A. F. 'Chemie oder Cymic.' *ZDMG* 30.
- Przyluski, J. 'La Problème du Soma.' *D. R. Bhandarkar Comm. Vol.*, Calcutta, 1940.
- Qazilbash, N. A. 'The Story of Indian Ephedra.' *The Pharmaceutical Journal*, Jan. 1947.
- 'Some Observations on Indian Ephedra.' *Quarterly Journal of Pharmacy and Pharmaceutics* XXI (4), 1948.
- 'Ephedra of the R̥gveda.' *The Pharmaceutical Journal*, London, Nov. 1960.
- 'Medicinal Plants of West Pakistan.' *The Pharmaceutical Journal* 87, July 1961.
- 'Pakistan Ephedra I.' *Pharmaceutisch Weekblad* 17, 1971.
- 'Pakistan Ephedra II.' *Pharmaceutisch Weekblad* 19, 1971.
- Radin, Paul. *The World of Primitive Man*, 1952.
- Ragozin, Z. A. *Media*, 1897.
- Ray, J. C. 'The Soma plant.' *IHQ* 15, June 1939.
- Ray, P. C. *A History of Hindu Chemistry*. Calcutta, 1903.
- Ray, Priyadarshan. *History of Chemistry in Ancient and Medieval India*. Calcutta, 1956
- Read, B. E. 'Ancient Chinese Medicine and its modern interpretation.' *Thien Hosia Monthly*, Shanghai, March 1939.
- 'Chinese Medicinal Plants.' *Flora Sinensis series XXIV*.
- Regmi, Delli Roman. 'The Control of Liquor in Ancient India.' *NR* 12. Nov. 1940.

- Reichner, H. K. 'Ephedraceae.' Flora des Iranischen Hochlands und der umrahmenden Gebirge (Persien, Afghanistan, Teile West Pakistan, nord Iraq. Azerbeidian, Turkmenistan). Graz (Austria), 1963.
- Renou, L. et Fillizat J. *L'Inde classique* I. 1947.
- Rgveda Samhitā* with Sāyana's Commentary Vols. I-V. Vaidika Samśodhana Mandal, Pune, 1933-1957.
- Rosenthal, F. *Ibn Khaldun the Mugaddimeh: An Introduction to History*. London, 1958.
- Roth, Rudolph von. 'Über den Soma.' *ZDMG* XXXV.
- 'Wo wachst der Soma.' *ZDMG* XXXVIII, 1884.
- Sachau, E. C. *Alberuni's India*. 1910.
- Said, Hakim Mohammed. *Medicine in China*, 1981.
- (ed.) *Essays on Science* (S. Mahdihassan Fel. Vol.). Karachi, 1989.
- Sāṅkhāyana Śrauta-Sūtra* with the commentary of Varadattasuta Ānartīya, edited by A. Hillebrandt. *Bibliotheca Indica*(I&II), Calcutta, 1885-99.
- Sarrasi, *L'Orient dévoilé* Paris, 1878.
- Sarwar, Gulam and Mahdihassan, S. 'The word Kimiya in Firdousi.' *Iqbal* (9), Lahore.
- Sastri, S. Srikantha. Hydro-Selenic Culture. *Man in India* 21, Jan.-Mar., 1941.
- Satapatha Brāhmaṇa* with Commentaries by Sāyaṇa and Harisvāmin (I-IV)., Venkateshwar Press, Bombay.
- Satyāśāḍha Kalpasūtra* with commentary, Ānandāśrama Sanskrit series, Pune.
- Savill, Sheila. *Pear's Encyclopaedia of Myths and legends*. The Oriental Pelham Books, London, 1977.
- Shah, C. S. and Shah, N. S. 'Pharmacognosy of Ephedra nebrodensis Tinea.' *Indian Journal of Pharmacy* 26, 1966.
- Shamasastri, R. 'The Rbhus and the four Soma-cups.' *PO* 7, 1942-43.
- Sieg, E. 'Indra und der Somaraub nach dem Rgveda.' *Festschrift Jacobi*, 1926, 228.
- Small, J. 'The Mahuang of Commerce.' *Quarterly Journal of Pharmacy* 1, 1928.
- *Chemist and Druggist*, 1938.
- Smith, F. P. *Materia Medica and Natural History of China*,

- Shanghai.
- Spiegel, F. *Die Indische Periode und ihre Zustände*. Leipzig, 1887.
- Srivastava, J. G. 'The Soma Plant.' *Quarterly Journal of Crude Drug Research* VI (1), 1966.
- Stapf, O. "Die Arten der Gattung Ephedra." *Denkschr. Akademie der Wissenschaften Wien* 56 (2) 1889, *Kew Bulletin Royal Botanical Gardens* 3. (1927), *Curt Botanical Magazine*, 1930.
- Stein, Sir Aurel. "On the Ephedra, the *Hum* plant and the Soma." *Bulletin of the London School of Oriental Studies* VI (2), 1931.
- Stoll, O. *Suggestion und Hypnotismus in der Völkerpsychologie* 2 Auflage, 1904.
- Śukla *Yajurveda Mādhyandina Saṃhitā* edited by Pandit S. D. Satavalekar, Aundh (Satara), 1927.
- Sūṣruta Saṃhitā* with the commentary of Cakrapāṇidatta. Nirnay Sagar Press, Bombay, 1932.
- Sūtras of Bharadvāja*, edited and translated by Dr. C. G. Kashikar, Parts I & II. Pune, 1964.
- Taittirīya Āraṇyaka* with Sāyaṇa's commentary Parts I-III. Ānandāśrama Sanskrit Series, Pune.
- Taittirīya Brāhmaṇa* with Sāyaṇa's commentary Parts I-III. Ānandāśrama Sanskrit Series, Pune.
- Tāṇḍya Mahābrāhmaṇa* with Sāyaṇa's commentary Parts I-II, edited by Pandit A. Chinnaswamy Sastri. Choukhamba Sanskrit Series, Varanasi.
- Thatte, W. D. 'Soma Plant.' *Bhavan's Journal* 15 (1), December, 1968.
- Uhl, L. L. 'A contribution towards the identification of the Soma plant of Vedic times.' *JAOS* XLV, 351.
- Unwala, J. M. 'Haoma the sacred plant used in the religious ceremonies of Parsis.,
- Usman Ali S. and others. 'The Soma – Its Botanical Identity and Pharmacognostic Anatomy.'
- Vaikhāṇasa-Śrauta-Sūtra*, edited by W. Caland. *Bibliotheca Indica*, Calcutta.
- Vārāha-Śrauta-Sūtra*, edited by C. G. Kashikar. Pune, 1988.
- Wake, G. and Staniland. *Serpent-worship and other Essays*.

- London, 1888.
- Wasson, R. Gordon. *Soma the Divine Mushroom of Immortality*.
New York, 1969.
- 'Soma : Comments inspired by Professor Kuiper's Review.' *III XII.*
- 'The Soma of the Rgveda—What was it?' *JAOS XCI* (2), 1971.
- 'Soma and Fly-Agaric.' *Ethno-Mycological Studies 2*. Botanical Museum of Harvard Univ., Cambridge, Mass., 1972, 58.
- 'Soma brought up-to-date.' *JAOS* 99 (1), 1979, 100-105.
- *The Wondrous Mushroom : Mycolatry in Mesomericia*. McGraw-Hill, New York, 1980.
- Watt, George. *A Dictionary of Economic Products of India*. 1890.
Wealth of India Vol. III, 1952.
- Wendelbo, P. 'Plants from Tirach.' *Magasin für Botanik I*, 1952.
- West, E. W. *Pahlavi Texts. SBE V, XVIII, XXIV, XXVII, XLI*, 1901.
- Whitney, W. D. 'On the third Volume of Eggeling's transl. of the Satapatha Brāhmaṇa with remarks on "soma the moon."'
PrAOS 1894, mars, p. XCV.
- Wilson, W. W. 'The soma offering in a fragment of Alkman.'
AmJPh. XXX, 188.
- Windischmann, F. 'Über den Somakultus der Arier.' *Abh. Ak. IV* (2), München, 1846.
- Wright, R. G. 'Ephedrine: Its sources and uses.' *Pakistan Journal of Forestry* 10 (2), 1960.
- Zimmer, H. *Altindisches Leben*. Berlin, 1879.

TILAK MAHARASHTRA VIDYAPEETH

Select Indological Publications

1. *Kauśikasūtra Dārilabhāṣya* (Commentary on the Kauśikasūtra of the Atharvaveda). Ed. by H. R. Diwekar, V. P. Limaye, R. N. Dandekar, C. G. Kashikar, V. V. Bhide. Pp. 211. Rs. 50-00
2. *Keśava's Kauśikapaddhati* (Commentary on the Kausikasūtra of the Atharvaveda). Ed. by V. P. Limaye, R. N. Dandekar, C. G. Kashikar, V. V. Bhide, S. S. Bahulkar. Pp. 600. Rs. 100
3. *Brahmasūtravṛtti* (Notes on the Brahmasūtras in Sanskrit). By Lokmanya B. G. Tilak. Pp. 188. Rs. 10-00
4. *Rasagaṅgādhara of Jagannātha* (Sanskrit text with Marathi translation). By R. B. Athavale. Vols. 1-3. Pp. 2136./ Rs. 170-00
5. *Ādiśaktice Viśvasvarūpa or Devīkośa* (Marathi encyclopaedia on the cult of goddesses). By P. K. Prabhudesai. Vols. 1-4. Pp. 2180. Rs. 190-00
6. *Vedāntapārijātasaurabha or Nimbārkāś Bhāṣya on the Brahmasūtras* (Sanskrit text with Marathi translation and indices). By Pt. D. D. Kavishvar. Pp. 680. Rs. 60-00
7. *Vākyapadīya (Brahmakāṇḍa)* of Bhāṭṭhari with autocommentary (Sanskrit text with Marathi translation and indices). Ed. and tr. Pt. by V. B. Bhagwat. Pp. 400. Rs. 50-00
8. *Hautrika or Kātyāyana-Hautra-Pariśiṣṭa*. Ed. and translated into English by Dr. C. G. Kashikar. Pp. li. + 218. Rs. 50-00
9. *Lüders Yāñce Varuṇaviṣayaka Vicāra* (Marathi) [Lüders on Varuna]. By Dr. M. A. Mehendale. Pp. 65. Rs. 5-00
10. *Vārāha-Śrauta-Sūtra*. Ed. By Dr. C. G. Kashikar. Pp. 82 + 300. Rs. 100-00